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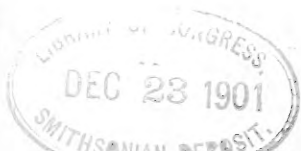
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INSTRUCTIONS to BINDER.—The SPECIAL INDEX, given with the 'Entomologist' for January, 1902, belongs to this Volume, and should be placed next to this General Index.

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EDITORIAL.

WE are very pleased to announce that MESSRS. KIRKALDY and LUCAS have kindly consented to join the Reference Committee of the 'Entomologist,' and will therefore become more intimately associated with the Journal. These gentlemen are already well known to our readers, and there is every reason to believe that their articles on British Rhynchota, Odonata, and Orthoptera, which have recently appeared in our pages, have greatly stimulated interest in these groups.

En passant we may remark that it is to be hoped that not only will insects of the orders adverted to receive increasing attention in the future, but that workers on the Coleoptera, Diptera, and Hymenoptera of this country may give us evidence of their activity.

The Editor wishes it to be understood that he is responsible for all unsigned matter published in the 'Entomologist.' All responsibility for articles and notes rests with their respective contributors, whose names or initials are always given. If the writer be a member of the Reference Committee, the views or opinions expressed by him are on his authority alone.

ON THE OCCURRENCE OF *COLIAS EDUSA* AND *C. HYALE*
IN 1900, AND THE RESULTS OF REARING THE VAR.
HELICE FROM *HELICE* OVA.

By F. W. FROHAWK, M.B.O.U., F.E.S.

THE first news I heard of respecting these butterflies during the past season was that on June 10th last, when my friend Mr. W. A. Cope forwarded me, for inspection, a living *C. hyale* male, which he had just captured near Cudham, Kent. A few days after this capture I heard of others having been seen in the south-eastern counties, principally Kent. I then predicted in the 'Field' that *C. hyale* would prove plentiful during the following August and September.

Excepting seeing one *C. edusa* on July 11th, in North Cornwall, I heard nothing more of either species until Aug. 15th, when I learnt that *C. hyale* was common in different parts of Kent, and that *C. edusa* was swarming in South Devon.

On Aug. 18th three friends and myself journeyed down to Sheerness, where we found *C. hyale* fairly plentiful, capturing over sixty specimens and about two dozen *C. edusa*, including one *helice*; the twenty *hyale* which I took consisted of eighteen males and two females. One female, being quite freshly emerged, I killed; the other, rather worn, I kept alive for ova, which, on the following day, deposited about forty, and continued depositing for one week, during which time I placed her upon five separate plants of clover. The number of eggs deposited upon the plants were 40, 80, 60, 42, and 14—total 236, which is about the full complement for this species. The eggs commenced hatching on Aug. 29th, and the larvæ are now (Nov. 17th) eighty days old, and hybernating. Some of them occasionally feed a very little, the majority remaining perfectly motionless (in this respect they precisely agree in habit to the *hyale* larvæ that I had under observation in the autumn of 1892, when I published notes on the earlier stages in the 'Entomologist,' then stating that *C. hyale* hybernated in the larval state). Although these larvæ were subjected to much heat and sunshine during September, they grew but slowly, while all the *helice* and *edusa* larvæ, which were kept under exactly similar conditions, fed up and pupated during the month. The *hyale* remained quite small, having only moulted twice by the time the *helice* and *edusa* were in pupæ. Another female *C. hyale*, captured by my wife at Addington, Surrey, on Sept. 7th (where we subsequently took others, as well as *C. edusa*) deposited 140 ova, the greater part of them being deposited on the 12th. We also captured about forty *C. hyale* near Broadstairs, Kent, between the 18th and 25th September, and also found *C. edusa* common, but

only observed three *helice*. The *edusa* varied much in condition, some being freshly emerged, while others very very worn; one pair I took in *coitu* on Sept. 22nd; the female was so much worn that it evidently had been flying for several days, but the male was, from its perfect condition, only just emerged. This worn female, and others kept alive for the purpose, deposited freely, and the worn one continued producing eggs until Oct. 3rd; the larvæ from them are now feeding, and will probably produce imagines about the end of December or early in January.

On Aug. 15th last I received a communication stating that *C. edusa* was swarming in South Devon, and that the var. *helice* was numerous. I thereupon wrote to my friend, Dr. Elliot, of Kingsbridge, expressing a wish to obtain living examples of *helice*, for the purpose of getting eggs and in the hope of rearing the variety. Upon receipt of my letter the doctor, most kindly, at once set out in search of specimens, and despatched five living *helice* to me on the 17th. These arrived at noon the next day, during my visit to Sheerness after *C. hyale*. Upon their arrival my wife found them to be in a very feeble state, owing to their long journey in the excessive heat then prevailing; she therefore fed them with sweetened water, and four of them survived. They were then placed upon a clover-plant, and one almost immediately commenced depositing. The following day I singled them out on to four separate plants of clover, and during the following eight days the four deposited in all between 850 and 900 eggs; these began to hatch on Aug. 24th, remaining only six days in the egg state, accountable to the hot weather. The first larva became full-fed and spun up on Sept. 19th; it pupated on the 21st, and the first imago emerged on Oct. 5th.

As will be seen by the following notes, the results attained out of the entire number reared are very interesting, as it shows the large proportion of *helice* produced from *helice* parents, which almost equal the normal females; in fact, exactly the same number of each emerged for several days, and it was only during the last few days of their emergence that the normal females gained slightly the lead.

As might be expected, the first specimens that emerged were males, many appearing before any females. The number of males bred amount to 302, of normal females 125, and *helice* 110, making a total of 537 of both sexes. It will be thus seen that the number of *helice* bred almost equals that of the normal females, and that the total number of females is 235 against 302 males. I had expected to breed a larger number of specimens, but from some mysterious cause quite 250 or 300 larvæ disappeared, as I had about 850 feeding when they were between the first and third moults (as I counted quite that number when changing their food-plants); but upon counting all the pupæ and the few larvæ

which I found from time to time dead, I was only able to account for about 580, instead of about 850. As the larvæ were carefully protected against earwigs, which are so destructive to young *Colias* larvæ, and not finding any trace of their remains, I am quite at a loss to understand what became of about 270; possibly cannibalism might account for some, but that seems hardly likely to be the case, otherwise I think I could not have failed noticing some trace of them, unless they fell from the plants and quickly decayed among the stems and earth, and thus escaped my notice.

However, the result attained is sufficiently satisfactory, as the *helice* form a most interesting and beautiful series, varying as they do in depth and tone of colour; the primaries vary in ground colour, from a mellow buffish orange to pure white. Between these two extreme forms every gradation of tone exists, even to clear lemon-yellow; there is also much variation in the secondaries; those with the deepest coloured primaries have the secondaries only very slightly greyer than a normal female; while the whitest specimens have delicate lilac-grey secondaries; two dozen specimens are more or less of the buffish orange form, being intermediate between the normal *edusa* female and a typical *helice*. The spots on the marginal borders vary a good deal in size and number; also does the central orange spot in the secondaries; in some it is intensely rich and deep in colour; in others it is light chrome-yellow, encircled with pale lemon-yellow. The under sides present most beautiful delicacy of colouring, especially the primaries, and one specimen has the whole of the ground colour of the primaries of a soft orange hue; the discoidal spots also vary much in size. Two of the *helice* are rather singular aberrations, one having the whole of the costal area of all four wings, from the median nervure to the apex, of a pale greyish buff, making the usual black of the apex and discoidal spots very faint, and the central secondary spots very pale yellow; the antennæ are also pale grey, instead of rosy red. The other specimen has the whole colouring very pale, the only part of the marginal band approaching to black is that at the anal angle of the primary, but the discoidal spots remain quite black.

The males bred vary a great deal in depth of ground colour, showing all degrees of strength, from a very deep rich orange, to the palest chrome-yellow; the marginal bands also vary in width, and those of the primaries are all more or less powdered with yellow scales; none have the borders anything like so black as in captured specimens; in many examples the yellow nervules run through the borders of all the wings; in one specimen they are so strongly marked that it gives the insect a strikingly different appearance. A large proportion of the males have the secondaries shot with a beautiful amethystine hue.

The normal females vary to much the same extent as the males in depth of the orange ground colouring. One rather fine aberration emerged on Oct. 12th, having the marginal bands of the primaries very broad, and the apical portion suffused to the discoidal spot, which is abnormally large; the spots in the borders are all but obliterated; it is of the same type of variation as the second figure in the second column represented on the coloured plate of *C. edusa* aberrations, published in the 'Entomologist,' March, 1878, but in my specimen the pattern is symmetrical, and the black borders of greater width.

I may add a few words relating to *C. edusa*. Of those I captured at Sheerness, Aug. 18th, six were males and one female; the latter started depositing the next day, and died on the 24th, after depositing about ninety eggs; these soon hatched, owing to the hot weather, and by the end of September most of the larvæ had pupated; from these an interesting series of imagines have emerged, showing about equal variation, as in the males and normal females bred from the *helice* ova. One female is an extremely handsome aberration as regards colour, having black secondaries shot with blue-green iridescence, and large light golden-yellow central spots and light golden-yellow primaries, which contrast in rich harmony with the dark secondaries; and the base of the primaries is also much darker than in normal examples.

November, 1900.

MISCELLANEA RHYNCHOTALIA.

By G. W. KIRKALDY, F.E.S.

ANISOPS FIEBERI, n. n.

= *A. niveus*, Fieb. 1851, nec (Fabr.).

The true *nivea*, Fabr., is, as I have previously shown (1899, Ann. Soc. Ent. France, p. 105), a small variety of *ciliata*, Fabr. The type is in the Fabrician Collection of the British Museum, and the species seems to be distributed over Central and Southern Africa, and Asia from Madras to China. The female of *fieberi* is scarcely distinguishable from that of *productus*, Fieb., but the male differs by the form of the cephalic projection. In *productus* this is long and triangular, apically pointed, somewhat roundedly; in *fieberi* it is shorter and distinctly truncate apically. *Fieberi* is distributed over British India; Celebes (Breddin, Mus. Halle).

ANISOPS BREDDINI, sp. n.

The species of *Anisops* are very variable within certain limits, and, as they are nearly always pallid, sordid whitish in colour

(individuals sometimes having an orange-red scutellum, and (occasionally) abdomen above), it is not easy to distinguish the closely allied species. The present species, which I dedicate to my friend Dr. Breddin, of Halle, and which is found in Celebes, Lura See bei Duri (Sarasin, viii. 95), can only be confused superficially with *vitreus*, Sign., from Madagascar. In both sexes, however, of *breddini* the eyes are actually contiguous intero-posteriorly; while in *vitreus*, even in the males, the interior margins of the eyes do not touch together. This character is constant in eight *breddini* and thirty-seven *vitreus* that I have examined. The type is in Coll. Breddin.

LOCALITIES.

Corixa affinis, Leach. Madeira; Zetland; (Mus. Perth and my collection).

C. lateralis, Leach (*hieroglyphica*, Duf.). Madeira (Mus. Perth and my collection).

MISCELLANEOUS NOTES.

Apache n. n. = *Hynnys*, Burm. (nec Cuv.). Type, *rosea*, Burm.

Calmar n. n. = *Mæonia*, Stål (nec Dana, 1850). Type, *punctata*, Sign.

Colmadona n. n. = *Telmessus*, Stål (nec White, 1848). Type, *fenestratus*, Thunb.

Dikraneura, Hardy, 1850 = *Dicraneura* auctt.

Embolophora, Stål, 1859 = *Liburnia*, Stål, 1866.

Hoplophorion n. n. = *Hoplophora*, Germ. (nec Perty).

Kallipterygia n. subg. n. = *Pterygia*, Lap., 1832 (nec Boit., 1798 [subg. of *Notocera*, Am. Serv.] subg. Type, *macquarti*, Lap.

Kallitaxila n. n. = *Taxila*, Stål (nec Doubl., 1847). Type, *granulata*, Stål.

Montandonista n. subg. n. = *Belostoma*, subg. auct. [subg. of *Amorgius*, Stål]. In the typical subgenus the pronotum has very wide lateral margins; these are much narrower in subg. *Montandonista*.

Peggia n. n. = *Nebrissa*, Stål (nec Walk.). Type, *nitida*, Stål.

Temora n. n. = *Rudia*, Stål (nec Costa, 1869). Type, *dilutus*, Stål.

Tristan n. n. = *Scaphula*, Fairm. (nec Bens. 1834).

ON CERTAIN SEASONAL PHASES OF BUTTERFLIES OF THE GENUS *PRECIS*.

BY A. G. BUTLER, Ph.D.

SOME few years ago my friend Mr. G. A. K. Marshall expressed the opinion that *P. simia* of Wallengren would prove to be the wet-season form of *P. cuama* of Hewitson, at the same time regarding my *P. trimenii* as an intermediate variation of the same species.

My great objection to this association of butterflies, differing so greatly from each other as *P. simia* and *cuama*, was that in several collections which had reached me at various times, and from different parts of Eastern Africa, not only *P. simia* and *P. cuama*, but also *P. trimenii* were obtained at all seasons, and therefore could not strictly be regarded as seasonal forms. It also struck me that whereas *P. simia* and *P. cuama* have the outer margin of the primaries strongly angulated, and even sub-falcate below apex, the insect to which I gave the name of *trimenii* shows a much less developed angle to these wings. Another point which I noted was the strong rosy belt across the wings in *P. trimenii*, which is wholly wanting in *P. simia*, and is rather less developed though present in *P. cuama*.

Being now engaged upon a revision of the genus, I have been able to look thoroughly into this question, with the following interesting result:—

Under *P. cuama* I find that two quite distinct species have been confounded—*P. antilope*, Feisthamel, and *P. cuama*, Hewitson—both palpably dry phases. Comparing these carefully with *P. simia* and *P. trimenii*, I find that *P. simia* is undoubtedly the wet phase of *P. antilope*, which, as Prof. Aurivillius has pointed out, is more heavily marked above with black, and lacks the subapical white spots of *P. cuama*. It also differs in the shorter costa and less falcate outer margin of the primaries. *P. trimenii*, on the other hand, is without question the wet phase of *P. cuama*, between which we have intermediate examples serving completely to link them.

So far as our localities show, although all four forms occur in Southern and South-eastern Africa, *P. simia* = *antilope* has a more northerly range than *P. trimenii* = *cuama*. The fact that the phases are not confined to season in these species seems to me a strong argument against the indiscriminate use of the term "seasonal form" for these variations. As we know, the *P. sesamus* and *P. natalensis* forms of the eastern representative of *P. octavia* may be captured not only during the same month, but on the same day of the month, and therefore, though phases characteristic of certain seasons, are not strictly seasonal forms.

ORTHOGRAPHICAL AND CLASSICAL "EMENDATIONS" IN NOMENCLATURE.

BY LOUIS B. PROUT, F.E.S.

So much has already been written on this thorny and very uninteresting subject that I ought to apologise for bringing it forward at all; but, as I am doing a good deal of work at entomological nomenclature, I feel it necessary to state succinctly the reasons which have led me to cast in my lot with the comparative few who reject "emendations" altogether (excepting in so far as to add in brackets "*recte*" so-and-so).

1. They are fatal to stability in nomenclature, giving occasion for endless controversy on matters of personal opinion and taste. *E. g.* because the name *siterata* of Hufnagel was not published with an etymology, and no satisfactory one could be found, it was seriously argued that it must be a misprint for "*literata*"; but what possible proof have we that this was so? And is *literata*, Don., to sink as a homonym to please these faddists? If anyone wants to see what intricacies originate from the admission of "emendations," let him turn to Proc. Ent. Soc. 1870, pp. v-viii.

2. It is sometimes very difficult to say what is absolutely the ideally classical form of a name, even when we know the root. See Ent. Mo. Mag. xxxvi. p. 194.

3. Names are names and nothing more, and insect names are no more subject to the rules of orthography than personal names. When we "classically amend" Mr. Smyth and Mr. Phillips, and turn Miss Clara George into Clarus George, we may reasonably begin to interfere with the insects.

4. It is absolutely illogical to allow names which are obviously mere combinations of letters with no meaning, such as the oft-quoted *Datana*, &c., of Walker, and yet to reject or alter others because their spelling does not indicate their meaning with sufficient accuracy.

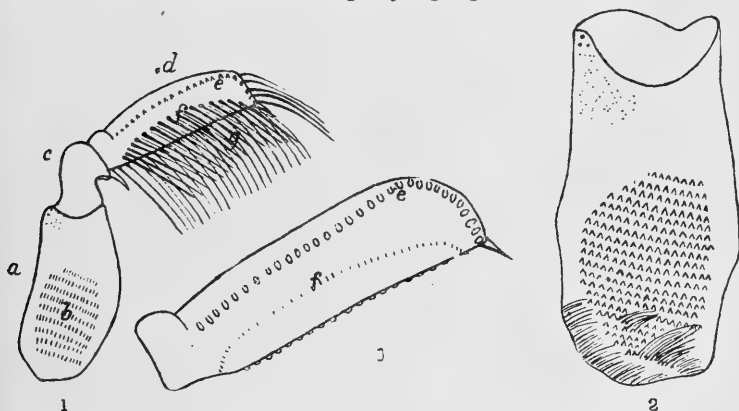
Of course, I am not advocating bad spelling or incorrect construction; the *Epichnoptorix*, &c., of Hübner are as great an eye-sore to me as to anyone, and I would conclude by urging nomenclators to act up to their best light, but at the same time pleading for the absolute inviolability of a name as first published; it is what I have long desired, but I had not the "courage of my convictions" until emboldened by the decided position which my friend Mr. Kirkaldy is taking (Entom. xxxiii. p. 26) in dealing with the Rhynchota.

THE STRIDULATION OF *CORIXA* [RHYNCHOTA].

BY G. W. KIRKALDY, F.E.S.

IN the 'Irish Naturalist,' 1894, pp. 253-6, G. H. Carpenter discussed this interesting subject, and concluded that it was caused by the movement of the "comb" on the inner surface of the anterior tarsi across the face. *Corixa* does at times move the anterior tarsi across the face, but this, I believe, is merely to cleanse the latter (and possibly the former). The stridulatory area lies, in fact, on the inner surface of the anterior femora, close to the base. It consists of a very large number of minute sharp points, arranged regularly in more or less parallel rows. The stridulation is caused by one of the tarsi being drawn across the femur of the opposite leg. For stridulation to take place through the interaction of the tarsus and the face, the movement would have to be longitudinal (whereas it is actually transverse), the apical part of the face being strongly multicarinate transversely.*

This femoral area and the tarsal comb are not found in any females of *Corixa*, and not in the males of *Cymatia*, Flor, usually treated as a subgenus of *Corixa*. It therefore seems well to treat *Cymatia* as a distinct genus, as was done by Douglas and Scott. The whole apparatus can be seen very clearly in *C. geoffroyi*, Leach, from which the accompanying figures are taken.



EXPLANATION OF FIGURES.

Fig. 1. Anterior femur, tibia, and tarsus of *C. geoffroyi*. *a*, femur; *b*, stridulating area; *c*, tibia; *d*, tarsus; *e*, "comb"; *f* and *g*, two rows of bristly hairs. 2. Femur further enlarged. 3. Tarsus further enlarged. Letters as in fig. 1. (The two rows of bristles are not shown in fig. 3, and the figures are all a little diagrammatic for the sake of clearness.)

* It is true that this part of the face is also medianly carinate longitudinally, but it could scarcely be a stridulatory area adapted to the highly specialised tarsal apparatus, and moreover this form of the face is common to both sexes.

THE GENUS OF "*DIRCENNA BARRETTII*," DANNATT.

BY PERCY I. LATHY.

MR. WALTER DANNATT (Entom. xxxiii. p. 299) describes and figures a new butterfly, belonging to the Neotropidæ, under the above name; he states that "this remarkable species, though believed by Dr. Staudinger to be a *Dircenna*, differs in some respects from hitherto known species in this genus."

A single male of this species has been for some time in Mr. Adams's collection, and when I arranged the Neotropidæ I placed it in the genus *Hymenitis*, next to *H. dircenna*, Feld.; on identifying it from Mr. Dannatt's figure and description, I compared it with several species of *Dircenna* and *Hymenitis*, and, though it differs slightly in neururation, I think it is in the latter genus that it should be placed, among *H. zavaletta*, Hew., and its allies.

In the neururation of the fore wing, *barrettii* differs from both *Dircenna* and *Hymenitis* in the cellular spur being emitted above lower discoidal nervule; this character, however, does not seem to be of great importance, as in long series of *H. zavaletta*, Hew., *H. zygia*, G. & S., and allied species, the position of cellular spur in relation to lower discoidal nervule shows considerable variation, and, though in no case is it actually above, in some specimens it is emitted from the same point. In the position of the middle median nervule, which at its origin is more than twice as far from lower median than upper, and in the lower median nervule being given off further from base than in *Dircenna*, it agrees with *Hymenitis*.

It is in the neururation of the hind wing that the relation to *Hymenitis* is most clearly seen; here the upper median nervule is shorter, the lower discoidal further from upper median, and upper angle of cell further from outer margin than in *Dircenna*. The præcostal nervule is forked, as in *H. zavaletta* and its allies; in *H. oto*, Hew., *H. libethris*, Feld., and similar species the præcostal is simple, as in *Dircenna*.

The character, however, which above all others makes me assign this species to *Hymenitis*, is the anastomosing of the upper discoidal nervule with the subcostal nervule near apex, thus forming a loop; this peculiar neururation is not found in any other genus of the Neotropidæ. The upper and middle median nervules are nearer together at their origin than in typical *Hymenitis*.

The locality of Mr. Adams's example is Chanchamayo, Southeast Peru; it differs slightly from the type, inasmuch as there is a faint dark bar crossing middle of cell of fore wing. In this respect it approaches *H. dircenna*, Feld., but it may be easily

distinguished from that species by the absence of dark patch at anal angle of hind wing, and marginal markings below being without reddish brown.

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SYNOPSIS OF EXPERIMENTS IN HYBRIDIZATION AND TEMPERATURE MADE WITH LEPIDOPTERA UP TO THE END OF 1898.

BY PROF. DR. MAX STANDFUSS.

(Continued from vol. xxxiii. p. 348.)

If we count all the secondary hybrids together, they amount to two hundred and eighty-two, among which was the considerable number of twenty-seven gynandromorphic specimens, which were divided over at least twenty broods. When we think that, after careful calculation, the lamented and capable entomologist, A. Speyer, came to the conclusion that there was only one gynandromorphic specimen to every thirty thousand typical ones in nature, and, to quote a special case, during the eighty years during which my father and I have collected, only sixteen gynandromorphic specimens have been taken in the open or have been bred from material obtained thence, of which three were hermaphrodite—it would be absurd to regard this high percentage of gynandromorphic forms of these secondary hybrids as a mere matter of chance.

There must be a certain reason for this fact. Is it to be sought perhaps in their hybrid origin?

We know, from the fine work on gynandromorphic Macro-Lepidoptera of Max Wiskott, of Breslau, and O. Schultz, of Berlin, that, among all the hybrids thus far bred, there were only ten gynandromorphic specimens. To this must be added another, bred by me in 1897, from a pairing of *S. pavonia* ♂ × *pyri* ♀, the only¹⁰ one among more than two thousand primary hybrids, which I have as yet bred.

The percentage of gynandromorphic specimens among primary hybrids is without the slightest doubt infinitesimal, compared with their occurrence among secondary hybrids. It is, however, relatively higher than among individuals of pure origin, which must not be lost sight of.

The condition of all the female parents of these secondary

¹⁰ A further gynandromorphic primary *Saturnia* hybrid developed in 1898 from a crossing of *S. pavonia* ♂ × *spini* ♀. The number of primary hybrids bred by me is now increased to over four thousand, on account of the large hybridization experiments with the genera *Drepana* and *Pygæra*.

hybrids has certainly still less to do with the high percentage of gynandromorphic forms. These were entirely pure females, drawn direct from nature, which, according to experience, have no inclination to produce gynandromorphic offspring.

We are therefore limited, above all, to the condition of the male parents, that is, as to the quality of their genital products as the resulting factor.

This with all the more surety, since the genital products of the female hybrids of the same form had shown, even on microscopic examination, various degrees of degeneration, or, indeed, on microscopic examination, were found quite wanting. The authenticity of this idea is supported by the fact that the degree of fertility of these male hybrids is parallel with the degree of development of the egg germs and eggs in the ovaries of their sister females. The fertility of the hybrid male of the crossing *S. pavonia* ♂ × *spini* ♀ was constantly higher than that of the male of the crossing *S. pavonia* ♂ × *pyri* ♀, just as the females of the first hybrid have more highly developed egg germs and eggs than those of the second.

The condition of these male sexual products must, on their side, undoubtedly be regarded as a result of the hybrid origin of these forms, and depends to a large extent on the physiological affinity of the species hybridized. The lesser the divergence and difference of the crossed forms, the more normal will be the qualities of the sexual products of the resulting intermediate form.

As the sexual products of female hybrids have suffered perceptible damage and disturbance of their development through their hybrid origin, so also have the sexual products of the males; the latter is perceptibly proved by the frequent failure in function of these sexual products. Sometimes they do not act at all, sometimes result in individuals of abnormal, that is, gynandromorphic, build, and finally, sometimes at least, according to their outward appearance, in thoroughly normally developed males and females.

From these results it must be granted that there are factors which, passive in the normal male sexual products, cause the development of the resulting individual in the direction of a normal male or female build.

Moreover, we saw from the figures that the germ of the females of the two pure parent forms were by no means equally influenced by the male sexual products of the same hybrids.

The male hybrid *S. pavonia* ♂ × *pyri* ♀ paired with *pavonia* ♀ only produced brood in 33 per cent. of the pairings, which varied in fertility from 4 to 62 per cent.; the same male crossed with *pyri* ♀ was infertile in more than 60 per cent. of all pairings, and the fertile pairings only resulted in 1 per cent. offspring. Hinderances of a purely mechanical nature are in this case

highly improbable, and we are therefore limited to the physiological aspect.

The cause of this exceeding difference in fertility of the two above named secondary hybrids must be sought in the different degrees of physiological affinity between the *pavonia* ♀ and this hybrid male on the one hand, and between the *pyri* ♀ and the same hybrid male on the other, as regards the whole physiological build of this hybrid form.

The degree of fertility of a form stands now, doubtless, in direct connection with the percentage of gynandromorphic individuals in its offspring; the greater the fertility the smaller percentage of gynandromorphic forms, and *vice versa*.

In this sense the gynandromorphic forms are according to their number entirely dependent upon the species of female used—that is, they are dependent upon the degree of relationship that exists between this female to the parent male.

We must now come to the conclusion that also the female sexual products possess *in potentia* factors which influence the build of the brood in the sense of normal males and females.

Now, to go back a bit, to judge the percentage of gynandromorphism among primary hybrids. This, as we saw, was by no means high, but still higher than among individuals of pure origin.

The sexual products of both parents are in this case, of course, of normal quality, but not their relationship, their physiological affinity. It seems here actually to be the fact that the less the physiological affinity of the crossed pure species is, the higher the number of gynandromorphic individuals among the resulting hybrids, and *vice versa*. Among the hybrids of the crossing of *S. pavonia* ♂ × *pyri* ♀ five gynandromorphic individuals have been noted—three by Mr. W. Caspari (Wiesbaden), and two by me; whereas among the hybrids of the cross between *S. pavonia* ♂ × *spini* ♀, to the best of my knowledge, not a single gynandromorphic specimen is known.

The number of these two hybrids at present bred is about equal, and, from the results of our experiments, it must be concluded that the physiological affinity between *S. spini* and *S. pavonia* is greater than that of *S. pyri* and *pavonia*.

Further, that the degeneration and malformation of the egg-germs which these gynandromorphic forms have been shown by anatomical investigation to possess is directly connected with the appearance of secondary female sexual characters in male individuals, and *vice versa*; the occurrence of secondary male characters in female individuals has long been known to be a fact.

(To be continued.)

CATALOGUE OF THE LEPIDOPTERA OF IRELAND: SUPPLEMENTARY LIST.

By W. F. DE VISMES KANE, M.A., M.R.I.A., F.E.S.

(Continued from vol. xxxiii. p. 333.)

PHOTHEDES CAPTIUNCULA, *Tr.* — Numerous about Ballyvaughan, Co. Clare, and much varied in colour, often wanting the rosy tinge, but always strongly marked and well defined. Torc Mt., Killarney, one.

AGROTIS SAUCIA, *Hb.* — Enniskillen (*A.*); Dromoland, Co. Clare, abundant (*Hon. E. O'Brien*).

A. CORTICEA, *Hb.* — Ballinskelligs Bay, and Castle Gregory, Kerry, abundant; Timoleague, Co. Cork (*R. D.*).

A. RIPÆ, *Hb.* — Again I am enabled to reinstate one of Birchall's doubtful species. Mr. W. Salvage informs me that he has taken a very reddish and well-marked form of *ripæ* at Rossbeigh, Kerry.

A. CURSOREA, *Bork.* — Whitepark Bay, near Ballycastle, Co. Antrim, grey forms, but some with whitish stigmata and costa like those taken at Yarmouth; Rossbeigh, Kerry, very abundant and variable, some approaching Shetland examples (*W. Salvage*).

PANOLIS PINIPERDA, *Panz.* — Single specimens at Enniskillen (*P.*); Tempo, Sligo (*McC.*); also Timoleague, Co. Cork (*R. D.*). It is probable that this moth is getting a wider distribution of late years.

PACHNOBIA LEUCOGRAPHA, *Hb.* — Several taken at Clonbrock (*R. E. D.*).

TÆNIOCAMPA OPIMA, *Hb.* — Tempo, one; Enniskillen (*A.*); Armagh (*J.*).

T. MINIOSA, *Fb.* — Glenmalure, abundant, and Derrybawn, Co. Wicklow (*G. V. H.*).

T. MUNDA, *Esp.* — Delete the entry of Clonbrock as a locality.

T. PULVERULENTA, *Esp.* — Timoleague, Co. Cork, scarce (*R. D.*); Tempo, Enniskillen, one.

ANCHOCELIS HELVOLA (RUFINA), *L.* — One (banded form), Magilligan, Derry.

DIANTHÆCIA LUTEAGO var. *BARRETTII*, *Dbl.* — One taken at the cliffs of Coolin, Courtmacsherry Bay, Co. Cork, by Mr. R. Donovan, this summer. Characters similar to the Howth form.

D. CAPSOPHILA, *Dup.* — Timoleague, Co. Cork (*R. D.*).

HECATERA SERENA, *Fb.* — Two at Castle Bellingham; Howth, one; Timoleague, Co. Cork (*R. D.*).

DASYPOLIA TEMPLI, *Thnb.*—One larva at Clonmacnois.

CLEOCERIS VIMINALIS, *Fb.*—Near Sligo (*McC.*).

HADENA PROTEA, *Bork.*—One taken at Killynon, Westmeath, by Miss Reynell. The occurrence of single specimens in Galway and Westmeath of a moth so plentiful in its English habitats is a phenomenon more inexplicable than would be its total absence.

H. DISSIMILIS, *Knoch.*—Ardtully, Kenmare, Co. Kerry; Timoleague, Co. Cork (*R. D.*).

ASTEROSCOPIUS SPHINX, *Hufn.*—During the last few years this moth has been captured in various Irish localities, having been very numerous in 1896, from ten to twenty-eight specimens per night having been taken by Mr. Dillon and myself at Clonbrock. In that year it was numerous at Curraghmore, Co. Waterford (*Rev. W. Flemyng*); and its capture was recorded in the Co. Dublin at Dundrum and Templeogue (*Ir. Nat. v. 317*). Dromoland, Co. Clare (*Hon. E. O'Brien*).

CUCULLIA VERBASCI, *L.*—This species must be deleted. Prof. Hart's record was a clerical error for *C. chamomillæ*.

C. ABSINTHII, *L.*—One taken flying to lime blossom at Timoleague, Co. Cork, this year, by Mr. R. Donovan. A small example, but in fair condition.

PLUSIA BRACTEA, *Fb.*—Single examples have occurred at Drumreask, Monaghan, Castle Bellingham, and Belleisle, near Lisbellaw; and seventeen were taken by Mr. Allen at Enniskillen on honeysuckle.

P. INTERROGATIONIS, *L.*—Cloonee, near Kenmare (*R. E. D.*).

HELIOTHIS ARMIGERA, *Hb.*—One at Killynon, Westmeath, 1896 (*Miss Reynell*).

CHARICLEA UMBRA, *Hufn.*—Several at Howth (*G. V. H.*); Timoleague, Co. Cork (*R. D.*).

BANKIA ARGENTULA, *Hb.*—Clonbrock (*R. E. D.*).

HYDRELIA UNCULA, *Clerck.*—Dromoland, Co. Clare (*Hon. E. O'Brien*).

EUCLIDIA GLYPHICA, *L.*—I have met with this species plentifully all over the Burren of Clare, and south to Dromoland.

CATOCALA FRAXINI, *L.*—A specimen flew into the window of Mr. Thompson's house, Marlborough Street, Derry, September, 1896. Possibly imported by a ship.

BOMOLOCHA FONTIS, *Thnb.*—Dalyston, near Loughrea, Co. Galway. Var. *rufescens*, *Tutt*; and var. *suffusa*, *Tutt*. The same forms also occur in Kerry; Timoleague, Co. Cork (*R. D.*).

GEOMETRÆ.

VENILIA MACULARIA, *L.*—Near Corcomroe Abbey, Co. Clare ; Timoleague, Co. Cork (*R. D.*).

EURYMENE DOLABRARIA, *L.*—Timoleague, Co. Cork (*R. D.*).

AMPHIDASYS STRATARIA, *Hufn.*—Timoleague, Co. Cork (*R. D.*).

BOARMIA GEMMARIA, *Brahm.*—Timoleague, Co. Cork (*R. D.*).

B. CINCTARIA, *Schiff.*—Timoleague, Co. Cork (*R. D.*).

DASYDIA OBFUSCARIA, *Hb.*—One taken on ragwort at Dowros Head, Co. Donegal, in 1898, by G. P. Farren. Birchall's reference to its occurrence in Kerry may perhaps be substantiated by some future collector. The addition of this species and *Larentia flavicinctata* to our list is an additional link between the Irish and the Scottish fauna.

HYRIA MURICATA, *Hufn.*—Two at Cloonee, near Kenmare, by Mr. Dillon, rather larger and more suffused with purple than those he has taken in Galway. A few at Creagh, near Ballinrobe ; and at Clonmacnois.

ASTHENA CANDIDATA, *Schiff.*—Plentiful at Dromoland, Co. Clare.

ACIDALIA SUBSERICEATA, *Haw.*—Timoleague, Co. Cork (*R. D.*).

A. IMITARIA, *Hb.*—Timoleague, Co. Cork (*R. D.*).

BAPTA TEMERATA, *Hb.*—Sligo (*McC.*).

SELIDOSEMA ERICETARIA, *Vill.*—Recess, Connemara (*Wolfe*) ; Timoleague, Co. Cork (*R. D.*).

(To be continued.)

NOTES AND OBSERVATIONS.

LEUCANIA VITELLINA.—A single specimen of *Leucania vitellina* recorded from Romford (Entom. xxxiii. 306) appears to be an exceptional occurrence, and to mark the eastern range of the species in this country for the past season. It is, however, within my knowledge that, starting with a few specimens taken in the neighbourhood of Brighton, and pursuing a western course, the species has occurred in increasing numbers at several places to the extreme limit of the south coast.—ROBT. ADKIN ; Lewisham, Nov. 1900.

ABUNDANCE OF LYCÆNA ARGIOLUS NEAR EASTBOURNE.—On visiting the ruined castles at Pevensey and Hurstmonceux in September last, I found *Lycæna argiolus* flying about the tall ivy-covered walls, in the afternoon sunshine, in far greater numbers than I had ever before seen the species. I had previously noticed the butterfly flitting about the ivy patches in the town of Eastbourne, but not more commonly than I had

been accustomed to see it in recent years. A careful scrutiny of the ivy flower-bud heads, however, revealed the presence of eggs and recently vacated egg-shells in abnormal profusion; sufficiently good evidence that the butterflies also had been unusually abundant, but that I arrived on the scene too late to see them in their greatest numbers. I hear also that in the Abbots Wood district the butterfly was unprecedentedly common.—ROBT. ADKIN; Lewisham, Nov. 1900.

THE VANESSIDS IN 1900.—The pages of the entomological journals have contained, during the past few months, an unusual number of records of the observation or capture of rare species, among which are included several of *Vanessa antiopa*. It is, however, surprising how seldom reference is made to the more common, though from many points equally interesting, members of the group. *Vanessa* (*Cynthia*) *cardui*, *V. io*, *V. atalanta*, and even *V. polychloros*, are generally regarded as “such common species” that few entomologists appear to attach any importance to their occurrence or absence; but I venture to think that much useful information might be gathered from precise records of the abundance or otherwise of, and exact details regarding, the various species in particular districts, especially in a season like the past, which appears, in many respects, to have been a peculiar one. Such records, if concisely put, need occupy but little space, and yet convey a large amount of information.—R. ADKIN; Nov. 1900.

EREBIA GLACIALIS: A CORRECTION.—At the meeting of the Entomological Society of London held on October 17th last, I made some remarks on some specimens of *E. glacialis* then exhibited by Mr. H. Rowland-Brown. In the report of that meeting published in the December number of the ‘Entomologist’ (xxxiii. 359) I am made to say that “the darker specimens approached to the form of *E. melas* found in the neighbourhood of Cortina-di-Ampezzo.” This is not quite correct; what I said was that the darker specimens were like “the form that had been supposed to be *E. melas* found near Campiglio.” I refer to the examples first brought into notice by Mrs. Nicholl, and afterwards taken by Calberla, myself, and others, and proved by Calberla to be *E. glacialis*.—T. A. CHAPMAN; Betula, Reigate.

SOUNDS PRODUCED BY PUPÆ.—I reared about forty larvæ of *Thecla quercus*, and after they reached the pupal stage I placed them in a tin tobacco box, and, by chance, placed the lot upon a cardboard box. During the evening, whilst setting insects, I constantly heard a sound like the ticking of many watches, but with a kind of slight rasping as well. Upon opening the tin all was quiet, but, on gently tapping the tin, the sounds commenced again. I then placed the tin upon the table and tapped, when the same ticking was resumed, but it was not quite so audible. The position they first occupied acted as a kind of sounding-board; I could repeat the experiment any number of times. All the pupæ produced imagines, so the sounds could not have been made by parasites. About twenty pupæ of *Vanessa polychloros* fell from off the cover of a cardboard box which I had placed upon a chair. I experimented upon these by striking the floor sharply; the pupæ then made a very peculiar noise, a repeated tapping, and when I ceased

they did likewise. Walking across the room would also cause the pupæ to tap again.—J. H. FOWLER; Ringwood.

THE INSECT FAUNA OF HAMPSHIRE. — Mr. H. Goss's interesting article, in the new 'History of Hampshire,' on the Lepidoptera, is not quite exhaustive as to the species which have been found in Hampshire and the Isle of Wight. There is a favoured nook in the downs near Winchester where *Procris geryon* has been not unfrequently met with. *Sphinx convolvuli* has been often taken in gardens near Southampton. *Sesia sphegiformis* and *S. formiciformis* have been often taken near Basingstoke. I have found *Melanippe hastata* in some numbers in a wood near Southampton, and *Chesias obliquaria* frequently near the same locality where the broom abounds. *Leucania conigera* and *Miana fasciuncula* are not at all uncommon. *Cymatophora* or has been fairly frequently taken at sugar in a wood near Winchester. *Leucania extranea* was taken at sugar in a wood near Lyndhurst Road station in the autumn of 1897. *Laphygma exigua* has been taken more than once at Freshwater. I might add that *Callimorpha dominula* is abundant in the water meadows between Winchester and Twyford; that *Phibalapteryx tersata* and *vitalbata* are quite common in the chalk districts; and that I have taken many specimens of *Triphana subsequa* (though unfortunately generally in a worn condition) in Parnholt Wood, between Winchester and Romsey. Is Mr. Goss quite sure that *Thera simulata* occurs in the county? I believe it to be a northern species, though there are specimens of *T. variata* which may be very like it. I have collected now for many years in this neighbourhood, but have never come across *Ennomos fuscantaria* (though I have bred it from ova sent me from Yorkshire), and have never heard that it "is common in the neighbourhood of Southampton."—J. C. MOBERLY; Woodlands, Basset, Southampton, Dec. 4th, 1900.

SCALES IN LYCÆNA. — Köhler discusses the battledore scales in *Lycæna* (1900 Zool. Jahrb. xiii. 247–58; 1 Plate and 6 figs.), and regards them as sexual scent-scales. He combats Kenel's conclusions, and asserts that they are not degenerating structures.—G. W. KIRKALDY.

VANESSA C-ALBUM IN IRELAND.—Up to the present time there has been no satisfactory proof of the occurrence of this butterfly in Ireland. Birchall, it is true, gave a record of it from Powerscourt (E. M. M. 1st series, viii. p. 6), but Mr. W. F. de V. Kane has shown (Entom. xxvii. p. 17) that this record was unreliable. I have now the pleasure of putting on record what is, I believe, an undoubted instance of its occurrence in this country. I have submitted the matter to Mr. Kane, and he appears to be satisfied. Last month the Rev. C. L. Garnett, Rector of Ardtrea, Stewartstown, Co. Tyrone, was on a visit in this neighbourhood, and came to have a look at my collection. In the course of conversation he mentioned that he had met with *V. c-album* in Ireland. I asked for a detailed account, which he very kindly gave. Unfortunately Mr. Garnett is not sure of the year, but it was several years ago. This is his account:—"It was about one and a half miles from Malahide on the Dublin road; July or August. I could not be mistaken, as I saw the creature settled, and it basked in the sun for a

time with its wings well spread. I made a bad shot in trying to catch it, and it made off in a very rapid manner indeed." Of course this was a case of migration, and it is a great pity Mr. Garnett cannot fix the year, as then there would be a possibility of tracing the origin of the insect, whether from abundance in England or on the continent.—W. F. JOHNSON; Acton Glebe, Poyntypass, Nov. 16th, 1900.

CAPTURES AND FIELD REPORTS.

COLIAS EDUSA AND *C. HYALE* IN 1900. — I captured several of the former and one of the latter here early in September, and took both species at Needham Market, and saw them near Aldeburgh, Woodbridge, Saxmundham, and Dunwich, in Suffolk, during the same month.—GERVASE F. MATHEW; Dovercourt, Essex, Dec. 10th, 1900.

Considering the abundance of *C. hyale* in England this year, a note on its appearance in the Rhine Valley may be interesting. I saw the first one on Aug. 2nd, careering over a wet meadow, on the slopes of the Taunus Hills, near Wiesbaden. On the 7th I saw several on a lucerne field, and took four close to Wiesbaden. On Aug. 12th we took the species again, at Braunfels, in the valley of the Lahn, near Wetzlar, and from that date till the 21st of the month we noted it daily there. On the whole, however, I should not call it abundant in that district this year, and *C. edusa* was entirely absent. Other butterflies were very numerous, but of these I hope to send you notes later.—ALFRED SICH; 65, Barrowgate Road, Chiswick, Nov. 20th, 1900.

In answer to your enquiry as to the northern distribution of *C. edusa*, I may say that I noticed a few females flying on the low cliffs at Criccieth, North Wales, during the early part of July last.—E. B. NEVINSON; 3, Tedworth Square, Chelsea, S.W.

COLIAS EDUSA AND *C. HYALE* IN YORKSHIRE, 1900. — Two males, Skipwith (Ash); Pocklington (Leadman); Ripon (Watts); two males Easingwold (Walker); two males and one female, Clifton-York (Hawkins); Rotherham (Bloor); one specimen in lane near Wadworth Wood (C. E. Young); Shipley Glen, Bradford (Booth and Beanland); "more plentiful in the Hull neighbourhood than since 1887; one collector took over fifty specimens in one day near Beverley, and some three dozen were seen in a clover-field, on the Humber-bank, by another; also odd specimens in the town (Boult); a specimen captured on Aug. 16th, near Guisborough, by the Rev. C. M. Withington, of Great Ayton; one seen in Grange Road, Middlesborough, on Sept. 10th, by Mr. C. Milburn; another seen in a clover-field near Middlesborough, on Sept. 12th, by Mr. Elgee"; sixteen specimens obtained on the Newbald Road, Beverley (Lowther); several specimens, one on the south cliff, Sept. 25th, by Mr. Gyngell, Scarborough (Lownsboro). One example of the var. *helice* was taken on the Yorkshire coast (Stevens). *C. hyale*, Bridlington (Corbett), Aug. 25th; Ripon (Fawcett); Beverley (Lowther); seen at Redcar, Middlesborough, and Newton-under-Roseberry, Sept. 13th (Sachse); one taken by a friend, on a privet hedge, at 8.45 a.m., near Hull (Cauldwell).—W. HEWETT; 12, Howard Street, York.

COLIAS EDUSA AND *C. HYALE* IN HAMPSHIRE.—On Aug. 25th I captured *C. hyale* at Fort Cumberland, near Portsmouth, on a grassy bank

close to the sea-shore. Another specimen was captured by me on Sept. 6th, at Gurnard, near Cowes, Isle of Wight. It was flying very slowly along the shore, and was not difficult to net. Immediately after this capture I saw yet another specimen, but was not fortunate enough to secure it, as it was flying too fast. *C. edusa* was in profusion this year in the Isle of Wight, and also on Portsdown Hill. At Hayling Island, near Portsmouth, *C. edusa* was abundant, and I saw *C. hyale* there also—EDMUND WINDER; 108, Lawrence Road, Southsea, Nov. 28th.

COLIAS EDUSA IN OCTOBER, 1900.—On Oct. 19th I took a female *C. edusa*, in the garden of a house on the cliff-front at Bournemouth, and on the 24th of the same month the species was flying in some numbers on the sides of both the east and west cliffs at the same place, but, owing to the difficult nature of the ground, I was only able to secure one specimen—a male. Both this latter specimen and the one taken in the garden above-mentioned are of interest from the fact that they were in absolutely perfect condition, notwithstanding the lateness of the season and the bad weather which we were then experiencing. I should say they had only emerged on their respective dates of capture. They are, moreover, considerably smaller than the usual size, and particularly well marked, especially the female. From this I am inclined to think that they represent a second autumnal brood. I may add that I saw no *C. hyale* at Bournemouth.—H. AINSLIE HILL; 9, Addison Mansions, Kensington, W.

COLIAS HYALE. — Three worn specimens captured by a youth in Birchington Marshes, in mid-July, set us on the watch. The first fresh specimen was noticed Aug. 15th, and on the 17th I netted and pinned exactly fifty specimens in two hours. Afterwards I was content to look for varieties, but without success, as to size. The insects scattered and got worn so quickly that I doubt if they winter here.—J. P. BARRETT.

ACHERONTIA ATROPOS AND *VANESSA (CYNTHIA) CARDUI* IN SALOP.—In reply to your note in the December 'Entomologist,' I beg to state that *A. atropos* has occurred in several localities about this district during the present year. I had four full-fed larvæ brought to me, from which I have succeeded in rearing three perfect insects by forcing. I hear also that a collector in the neighbouring town of Whitchurch has obtained three larvæ, one of which I saw before its pupation. And in the neighbourhood of Market Drayton a large number of pupæ have been found by the potato-diggers, as many as a hundred being met with on one farm, though they did not find their way to me. I have also taken several fresh specimens of *V. cardui*.—CHAS. F. THORNEWILL; Calverhall Vicarage, Whitchurch, Salop, Dec. 14th, 1900.

ACHERONTIA ATROPOS IN KENDAL DISTRICT.—It might be of interest, to complete my note on *A. atropos* (Entom. xxxiii. 353), to add that four more males (the last of female proportions) have successfully emerged (all from larvæ I myself found), under gentle warming by the fire, on the following dates:—1st, Nov. 11th; 2nd, Nov. 12th; 3rd, Nov. 16th; 4th, Nov. 24th. All the specimens emerged between 8 and 12 p.m.—A. M. MOSS; 12, Greenside Kendal.

ACHERONTIA ATROPOS IN YORKSHIRE.—Hovingham, August (Worsley); Boston Spa, Aug. 19th (Prince); two larvæ, Ripon (Smith); fifteen larvæ, Beverley (Boyes); Keighley, Aug. 30th (Longton); an imago, Aug. 30th, Horsforth; larvæ, Netherton (White). The above records are from the

'Yorkshire Post,' whilst the following are what I have had sent me by many correspondents:—One imago at the electric light, St. Sampson's Square, York, Oct. 22nd (Hawkins); one larva, Benningborough (Hewett); larvæ at Goole (Roper), Bridlington (Hobson), Normanton (Townsend), Skipwith (Ash); one larva, Haxby (Thurgood). Several larvæ, Pocklington, one of these the finder had stuck a knife into, "to see if it was alive"; and another was cut into with a spade, "to see what it was like" (Hewett); plentiful all over the Hull district, one collector had eleven dozen larvæ sent from Kilnsea, at four shillings a dozen (Boult); three larvæ, Stanley, near Wakefield; one larva, Newton-on-Ouse, near York (Hawkins); two larvæ, Pickering (Metcalf); "from August to October larvæ were frequently brought to me by potato-pickers; through forcing I have bred several imagines from these," Doncaster (Corbett); "some fifty larvæ and pupæ obtained at Beverley, four of which I secured myself" (Lowther); two larvæ, Sept. 21st, Kildale, and pupa, Nov. 3rd, Redcar (Sschse); larva, Withernsea (Cauldwell); "one caught, Worsborough Bridge, June 18th; flew in at open bedroom window at night" (Whittaker); one imago taken at Scarborough, Aug. 4th; larvæ at Sherburn, Aug. 24th; at Broughton, Sept. 3rd (Lowusboro); one perfect insect in the spring, three larvæ in August, one pupa in September, all close to Ayton (Hey); four larvæ at Whitby (Halliday)—W. HEWETT; 12, Howard Street, York.

ACHERONTIA ATROPOS IN SCOTLAND.—Mr. A. A. Dalglish (Ann. of Scott. Nat. Hist. 1900, p. 250) records a specimen, taken in York Street, Glasgow, on Sept. 20th, and one taken off a beehive at Kilmarnock, on July 11th last. Mr. R. Service, in the same journal, records a larva of this species from near Dumfries, another from near Lockerbie, and a third example from Borgue, in Kirkcudbrightshire; all these were found in the latter part of August. A pupa was obtained on Sept. 20th, also near Dumfries.

CLEORA GLABRARIA IN SCOTLAND.—Eight specimens of this species are recorded by Mr. A. Elliott from Roxburgh. They were found on July 25th and 27th last, at rest on the trunks of Scotch fir. Mr. C. G. Barrett, who has seen the specimens, confirms their identity. (Ann. of Scott. Nat. Hist. 1900, p. 250.)

ENNOMOS AUTUMNARIA (TILIARIA).—I think this species is well naturalized here now, as it occurs every season. This autumn I captured two females, with few eggs left in them. The larva feeds up readily on the balsam poplar. Given a suitable summer next year, I expect the gas-lamp at my front door (which is in direct line with the North Foreland Light-house) will attract a fair series.—J. P. BARRETT; St. John's Villas, Margate.

COLLIX SPARSATA DOUBLE-BROODED.—For three years past I have met with imagos, more or less worn, in June, and twice, on going for the larvæ in August, took imagos in similar condition. This season was backward. On June 20th I captured about a score imagos, no traces of larvæ; on July 30th a few larvæ nearly full-fed, no imagos; on Aug. 25th another score of imagos, mostly fine, no larvæ; on Oct. 6th full-fed larvæ not uncommon.—J. P. BARRETT.

MACROGLOSSA STELLATARUM. — After being comparatively scarce for some years, the "humming-bird moth" seems well established, the larvæ having been obtainable wherever a bit of bedstraw grew in the autumn. During October six or seven fresh imagos have come into the house to hibernate; one is still hidden in my bedroom. but I have neither seen nor

heard of a specimen in the open. Is this the usual habit of the insect?
J. P. BARRETT.

COREMIA QUADRIFASCIARIA AND MELANIPPE PROCELLATA IN ESSEX.—With reference to notes on the occurrence of these species in this county, in this year's 'Entomologist,' by the Rev. Gilbert H. Raynor and others, I may mention that I have taken the former on several occasions in this district, and once bred it, though I cannot remember where I took the larva, or what it was like. Of the latter, one was taken by one of my sons here, on July 30th. There is no chalk in the neighbourhood, nor is there any wild clematis within ten or twelve miles that I know of, though I have noticed it in a few gardens, and have some in my own.—GERVASE F. MATHEW; Dovercourt, Essex, Dec. 10th, 1900.

DASYCAMPA RUBIGINEA IN BERKSHIRE.—Whilst collecting insects at ivy-bloom, on Oct. 16th, at Padworth, my father, Mr. H. Garrett, took a fine and perfect specimen of *D. rubiginea*; he searched for more several nights after, but was unsuccessful in obtaining another specimen.—HENRY E. GARRETT; 3, Brewer's Green Mews, Victoria Street Westminster, S.W.

VANESSA ATALANTA, MACROGLOSSA STELLATARUM, AND ÆSCHNA MIXTA IN KILBURN.—On the morning of Oct. 1st *V. atalanta* and *V. urticae* were still on the wing, in the nursery garden close to the Kilburn and Brondesbury Met. Station, and captured by the proprietor. I also noticed a specimen of *M. stellatarum* darting in and out among the flowers there. On the morning of Oct. 9th *V. atalanta* and *Æ. mixta* were noticed by me in the vicinity of West End Midland Railway Station. This is only the second specimen of *Æ. mixta* that I have seen in this neighbourhood.—(Rev.) F. A. WALKER; Dun Mallard, Shoot-up-Hill, N.W., Oct. 9th, 1900.

VANESSA ATALANTA IN SCOTLAND.—According to Mr. R. Service (Ann. Scott. Nat. Hist.) this species was abundant in Solway last autumn, especially in gardens, in one of which, not far from Southernness, he counted over two hundred specimens.

CIRRHÆDIA XERAMPELINA AND VAR. UNICOLOR IN NOTTS.—I took a good number of the above last August, and one of the females is a splendid variety. The fore wings are all of the same ground colour as the central band. The band on the hind margin is also a shade darker, and more of a purple tint. Two faint yellow lines mark where the central band should be. Is this rare insect subject to much variation?—A. SIMMONS; Rutland House, West Bridgford, Nottingham.

[The variety referred to above appears to be an example of var. *unicolor*, Staud. A few specimens of this form have been previously recorded from localities in the North of England, and we understand that it is of regular occurrence in the Isle of Man.—ED.]

XANTHIA GILVAGO IN THE BROMLEY DISTRICT.—During the first week in October last I took a fine specimen of *X. gilvago*, at sugar, in Barnett Wood, near here,—A. J. LAWRANCE; 8, Cross Road, Bromley Common, Kent, Nov. 8th, 1900.

PLUSIA GAMMA.—To-day has been beautifully bright and warm, and, while walking on the sea-wall about noon, I saw a moth fly in from the sea. It passed over my head and settled on a tuft of grass, and upon walking up to the spot I found it was a fine fresh-looking example of this common species. By the way, how does *gamma* pass the winter—in the perfect,

pupa, or egg state? I have often seen the larva quite small at the end of October.—GERVASE F. MATHEW; Dovercourt, Essex, Dec. 10th, 1900.

ACIDALIA CONTIGUARIA, *Hb.*, AT CRICCIETH.—I do not think that this locality has been recorded, but as this is the third year I have met with it there, it may fairly be said to have established itself some distance from its old haunts. The case-bearing larvæ of *Diplodoma marginepunctella*, St., were also taken in some numbers off the lichens growing on the rocks and stones in the field-walls at the same place.—E. B. NEVINSON; 3, Tedworth Square, Chelsea, S.W.

ODONATA AT LEE, KENT.—I captured *Lestes sponsa*, *Ischnura elegans*, and *Agrion puella* at Lee in August last.—F. M. B. CARR.

SPHINX CONVULVULI AT EASTBOURNE.—Whilst attending a concert at the Floral Hall at Eastbourne, one evening at the end of August last, I met a gentleman who was holding a live specimen of *S. convulvuli* between his finger and thumb. He told me that he had just knocked it down with his hat while it was flying to electric light in the garden.—R. ADKIN.

SPHINX CONVULVULI IN SCOTLAND.—Mr. R. Service (*Ann. Scott. Nat. Hist.* 1900, p. 248) states that a specimen of *S. convulvuli* was taken at Portpatrick, on Aug. 20th.

MIGRANTS.—Our proximity to the Continent gives a touch of excitement to sugaring (not often does the prize appear) as to what may turn up. I recollect rejoicing over one *Agrotis saucia* in Dulwich Wood; well, on Sept. 21st last, *A. saucia* was commoner here than I have ever seen *Xylophasia polyodon*. Last year, in same locality, I took six. *Leucania vitellina* has hovered about for twenty years past; this year we had five specimens and more seen, but not captured; *L. albipuncta* also turned up. *Aporia cratægi*: I had become afraid that this species had entirely disappeared from this neighbourhood, but lads with nets teach us something sometimes, and they have caught at least a dozen specimens in 1900.—J. P. BARRETT.

LATE AND EARLY DATES OF CERTAIN LEPIDOPTERA IN CORNWALL.—On Oct. 18th, 1897, I took *Polyommatus phlæas*, *Pieris brassicæ*, *P. rapæ*, *Colias edusa* (two males), *Pyrameis cardui*, *Vanessa atalanta*, *Pararge egeria*, and *P. megæra*, all on one railway bank in a sheltered cutting; *C. edusa*, Nov. 9th, 1889; Oct. 18th, 1897; Oct. 26th, 1898; Nov. 16th, 1899. *Polyommatus phlæas*: Oct. 18th, 1897; Nov. 3rd, 1900, the latter in beautiful condition and fairly strong in flight. *V. atalanta*, Oct. 18th, 1877; Nov. 4th, 1900; in strong flight and good condition. *V. io*: Feb. 12th, 1899, on the wing. *Macroglossa stellatarum*, Nov. 24th, 1899; Nov. 28th, 1900. *Arctia (Chelonia) caia*: Nov. 10th, 1899; emerged from pupæ in a cold outhouse, from larvæ taken Aug. 25th, and which pupated early in October. *Phlogophora meticulosa*: Nov. 3rd, 1900; larva of this species, Feb. 16th, 1898, and which pupated, and the imago emerged May 2nd, 1898; also a full-fed larva, Dec. 2nd, 1900, found feeding on chrysanthemum flowers in garden, and is now pupating.—W. A. ROLLASON; The White House, Truro, Dec. 10th, 1900.

NOTES FROM BRIGHOUSE.—*Macroglossa stellatarum* has been commonly taken in this district this year. *Plusia gamma* in extraordinary numbers. *P. chrysitis* and *P. iota* have also been taken, not uncommonly. *Vanessa atalanta* and *V. urticæ* have been present in good numbers, as well as *Pieris*

brassicæ. I may also mention that at 10.30 p.m., Aug. 2nd, a fine specimen of *M. stellatarum* came in at the open window of my bedroom, apparently attracted by the light. Is this anything unusual?—THOS. B. BLAKEBOROUGH; "Ashlea," Brighouse, Nov. 17th, 1900.

NOTES FROM BRODICK, ARRAN, N.B.—In reply to your note in the December number of the 'Entomologist,' as to the few reports of *Colias hyale* and *C. edusa* in the northern districts of England and Scotland, I may mention that I spent the month of August and the beginning of September at Brodick, Arran, N.B., and during that time I did not see a single specimen of either of these species. The following, however, were some of my captures:—*Argynnis aglaia*, *Nonagria fulva*, *Hydræcia nictitans*, *H. micacea*, *Charæas graminis*, *Polia chi*, *Mania maura*, *Larentia olivata*, *L. miata*, *Cidaria russata*, *M. tristata*, *Melanthia rubiginata*, *Anaitis plagiata*, *Choreutes scintillulana*, *Hedya paykulliana*, *Peronea schalleriana*, *P. comparana*, *Leptogramma (Oxygrapha) literana*, *Dictyopteryx contaminana*, *Pamplusia monticolana*, *Grapholitha (Calosetia) nigromaculana*, *Eupæcilia angustana*, *Plutella cruciferarum*, *Cerostoma xylostella*, *Depressaria umbellana*, *Chelaria hübnerella*, *Pterophorus acanthodactylus*.—ARCHDALE SHARPIN; 23, Kimbolton Road, Bedford.

NOTES FROM SOMERSETSHIRE.—From August 9th to 17th I stayed with my friend Mr. W. W. Lane, at his house in Weston-super-Mare. Though the time was very much taken up with other things, I managed to do a little entomologising, of which the following is the result. *Pieris rapæ* and *napi* were of course common. In the woods at the back of the town I saw two *Argynnis paphia*, and also a lovely var. *valesina*, which was in perfect condition, but, alas, I was unarmed. In these woods, too, *Pararge egeria* and *Epinephele ianira* were both common. On the rough stony ground which fringes these woods I found *Vanessa io*, *atalanta*, *cardui* (the last of these seemed to come out just before I left), *Pararge megæra*, *Polyommatus phlæas*, *Lycæna icarus (alexis)*, and *L. argiolus* very plentiful. *Macroglossa stellatarum* was very common flying about in the sunshine. Some old poplar trunks in the Park were very badly bored by *Cossus ligniperda*. *Triphæna comes (orbona)* and *pronuba* were very common, while *Plusia gamma* was more plentiful close to the woods than was pleasant. We went to Cheddar to see the world-famed caverns, and, after having done this, we climbed the cliffs which border the roadside. Here I noticed the following:—*P. rapæ* and *napi*, *Vanessa io*, *Satyrus semele*, *Epinephele ianira*, *Lycæna astritrache (medon)*, and *Hesperia thaumas (linea)*; also one young larva of *Bombyx rubi* and three or four of *Euchelia jacobææ*. *Gonopteryx rhamni* and *E. tithonus* were common along the hedges, where I also found a few *Phalera bucephala* larvæ. Returning home, I found a male *Bombyx quercus* on Yatton Station platform. *Locusta viridissima* was very common at Weston-super-Mare among the raspberry canes in the garden, where, I am told, it established itself about three years ago.—OSCAR WHITTAKER; Morelands, Heaton, Bolton, August 21st, 1900.

THE SEASON OF 1900.—The season just passing has been again a good one for the Rhopalocera generally in localities I have visited. But I think the midsummer and autumn species have been on the whole more numerous than those of the spring or early summer. This seemed specially to be the case with *Euchloë cardamines* and *Argynnis euphrosyne*, both of which I did not notice so frequently in South Wales as in some seasons. In the month of May several days were cold in temperature, which may have had some

influence; and yet, on the other hand, *Lycæna argiolus* occurred in fair numbers as usual. Towards the end of June (28th) I noticed two specimens of *Colias edusa* in the valley of the Tawy, Carmarthenshire; and, again, one specimen in Montgomeryshire, in the Dovey Valley, on July 10th; a male specimen of *Euchloë cardamines* was taken on July 3rd in the same district. During this month *Argynnis aglaia* and *adippe* might frequently be met with. Larvæ of *Vanessa io* were very abundant; and later on the imagines began to appear frequently. *V. cardui* I have seen now and again throughout the summer, but never commonly; *atalanta*, however, has been most abundant during the autumn months. *Colias edusa*, I imagine the first of the new brood, I again saw in Montgomeryshire on August 12th; and during September, when in North Devon, it might frequently be turned up; and I have heard of *C. hyale* being found in several different localities, but I, personally, did not see a specimen. *Lycæna icarus*, second brood, was abundant in N. Devon; and *Polyommatus phleas* fairly so. I saw a few specimens of *Macroglossa stellatarum* at the end of July in Wales, and occasionally later in the autumn in Devonshire, but not as it occurred last season; the last specimen noticed was on October 6th. Larvæ and pupæ of *Acherontia atropos* have been reported not unfrequently in parts of Somersetshire, but I have not heard of *Sphinx convolvuli*. Three larvæ of *Deilephila euphorbiæ* were reported to have been found near Cirencester, Gloucestershire, at the end of the month of August; two of them found by a lad just below the surface of the soil. The account appeared in the 'Gloucestershire Standard.' I am making enquiries respecting this find.—T. B. JEFFERYS; Bath, October, 1900.

NOTES FROM NORFOLK.—During the latter part of July and August I did some collecting in Norfolk, all the following insects being seen within a three-mile radius of Norwich. Sugar was fairly successful as regards the number of insects that turned up; these were:—*Thyatira derasa* (rather worn), *Dipterygia pinastri*, *Mamestra brassicæ*, *N. c-nigrum*, *N. plecta*, *Triphæna pronuba*, *T. fimbria* (mostly in poor condition), *T. orbona*, *T. ianthina*, *Amphipyra pyramidea*, *A. tragopogonis*, *Phlogophora meticulosa*, *Plusia gamma*, *Catocala nupta* (in splendid condition), *Dianthæcia cucubali*, *Agrotis suffusa*, *A. puta*, *Leucania pallens*, *Xylophasia polyodon*, *X. lithoxylea*, *Euplexia lucipara*, *Hypena rostralis*, *Gonopteryx libatrix*, *Acronycta megacephala*, and *Xanthia citrigo*. Light was rather a failure, only producing the following:—*Smerinthus populi*, *Philodonta palpina*, *Odonestis potatoria* (one very dark male), *Triphæna pronuba*, *T. fimbria*, *Plusia gamma*, *Abraxas grossulariata*, *Lasiocampa quercifolia* (one very dissipated specimen), *Lithosia complanula*, *Cilix spinula*, and *Cerigo cytherea*. Larvæ I neglected, but somewhat casual hunting produced:—*Cerura vinula* (of which I found over twenty caterpillars in about three days, and could have probably collected more had I so wished), *Acronycta aceris* (one), *Smerinthus tiliæ* (one), and *Sphinx ligustri*.—W. T. HARRIS; 17, Micheldever Road, Lee.

NOTES FROM EASTBOURNE.—On June 9th I went to Eastbourne for three weeks. Although I arrived somewhat late in the evening, I got out my "apparatus," and started for a place called "Paradise," the only piece of wooded land near Eastbourne itself. The first thing that turned up was *Hepialus lupulinus*, a white var. of which occurred in swarms; besides these *Bapta taminata* was very common; *Melanthia ocellata* occurred sparingly, *Eupithecia vulgata* was common, and single specimens of *Agrotis*

ripæ, *Melanippe galiata*, *Coremia ferrugata*, *Cidaria russata*, and *Larentia pectinitaria* turned up. This ended my first evening, and I was somewhat disappointed with the prospects. June 10th. I did not get much work in. Besides *C. ferrugata*, *B. taminata*, and *H. lupulinus*, I took specimens of *Zonosoma (Ephyra) punctaria*, *Apilates citraria* (one), *Lycæna bellargus* (common), *Syrichthus malvæ*, *Euclidia mi*, and *Cidaria corylata*, mostly at Beachy Head. June 11th. I got out before breakfast, and again went to Beachy Head. *L. bellargus* swarmed, as also did *L. icarus* and *L. minima*, and single specimens of *Melanippe subtristata* and *Eupithecia centaureata* turned up. Later, I trained to Hailsham, and walked thence to Polegate through Abbott's Wood. *Argynnis euphrosyne* was very common, and I was very much surprised to capture a specimen of *Melitæa athalia*, the only one I took. Besides these, *Melanippe montanata*, *Asthena candidata*, *Acidalia remutata*, *Cidaria corylata*, *Zonosoma porata*, *Cabera pusaria*, and *Iodis lactearia* were common; while single specimens of *Euchloë cardamines*, *Polyommatus phlæas*, *Strenia clathrata*, *Platypteryx hamula*, *Coremia propugnata*, *Anaitis plagiata*, *Cabera exanthemaria*, *Thera obeliscata*, and *Eupithecia virgaureata* occurred. In the evening, as it was getting dusk, I was astonished to see three specimens of *Vanessa cardui* flying, and, after a deal of patience, I succeeded in capturing two. Does this species usually fly at dusk? Although I have seen many before, I never saw one on the wing at dusk. Among other species, *Cidaria russata*, *C. corylata*, *Grammesia trilinea* (a smoky var.). June 12th. *Acontia (Dysthymia) luctuosa*, *Strenia clathrata*, and *Lycæna minima* were taken. In the evening of June 13th I went to "Paradise" again. Besides the usual number of common species, I found two beautiful specimens of *Numeria pulveraria*, and one male *Arctia villica*. 14th. I did not do any very active collecting, but took a nice specimen of *Lobophora viretata* off a wall in Eastbourne. 16th. I went nothing in the evening, and obtained, among other things, *Cidaria immanata*, a single specimen of *Coremia unidentata*, and a female *Orgyia pudibunda*.

Thecla rubi and *Argynnis selene* occurred sparingly in Abbotts Wood on the 18th, and among other species that I captured was *Tephrosia exter-saria*. 25th. *Plusia gamma* swarmed at Eastbourne, and single specimens of *Hecatera serena*, *Caradrina cubicularis*, and *Dianthæcia conspersa* turned up. 26th. I visited Heathfield, and took in a fine pine-wood there, *I. lactearia*, *T. obeliscata*, *Bupalus piniaria* (very common), and single specimens of *Melanthia albicillata*, *Eupithecia coronata*, *Z. porata*, and *Ellopiæ fasciaria*. 27th. A specimen each of *Plusia chrysitis*, *Melanippe rivata*, and *M. galiata* at Eastbourne, besides the ordinary moths. 28th. I again visited Heathfield, the weather being more promising than on the 26th. *Euthemonia russula* was common on heath; I took twelve males to two females. *Bupalus piniaria* was also very common—two females to one male. (I have never before observed the sexes of this species in these proportions.) *T. obeliscata* (common), *L. pectinitaria* (one), *Ematurga atomaria* (males and females common), three *Macaria liturata*, two *Zygæna filipendulæ*, *Eubolia palumbaria* (very common), and single specimens of *Lithosia mesomella*, *Iodis vernaria*, and *Phytometra ænea*. 29th. Took two beautiful specimens of *Chærocampa porcellus* in some long grass at Beachy Head.—STANLEY A. BLENKARN; Clifton House, East Dulwich Road, S.E.

NOTES FROM DOVER.—Although I have done but little collecting this season, yet a few notes of the insects taken in this neighbourhood may be

of interest. During March and April I bred, amongst other things, *Dasychira pudibunda*, *Drepana unguicula*, and *Demas coryli*. On April 21st *Fararge egeria* was out; I only took one specimen this year, where in previous years I have taken them in plenty. The advance of bricks and mortar is the cause of this. On the same day two nice *Cidaria suffumata*, with *Anticlea badiata* and *Tæniocampa rubricosa*. There are so few salallows about this district, and what there are are so far from the town, that I did nothing in this line. During May *Halias prasinana* and *Zonosoma punctaria* emerged, and a nice *Notodonta chaonia* was taken on the sea-front at the electric light. On the 24th *Euchloë cardamines*, *Nisoniades tages*, *Lycæna* (*Cyaniris*) *argiolus*, *L.* (*Polyommatus*) *bellargus*, *Nemeobius lucina*, and *Thecla* (*Callophrys*) *rubi* were out. This year *L. argiolus* seems to have been more plentiful than ever—it was everywhere. I noticed several specimens of the second brood, which I do not remember having done before. June brought (*inter alia*) *Zonosoma vmicronaria*, *Bapta temerata*, *B. bimaculata* (*taminata*), *Minoa murinata* (*euphorbiata*), *Ligdia adustata*, *Euclidia mi*, *E. glyphica*. A couple of *Dianthæcia albimacula* were taken flying at *Silene nutans*. One turned out to be a female, and I obtained a few ova; they duly hatched, and were fed on bladder-campion, and all went, as I thought, well. On turning them out, however, I found but two pupæ and a fat larva, while another pupa was partly eaten. I think these larvæ must be cannibals. Larvæ of *Porthesia chrysorrhæa* were in large numbers, along with a few *Diloba cæruleocephala*, on the whitethorn hedges. *Lycæna* (*Cupido*) *minima* was to be taken plentifully up by the convict prison, and one could obtain perfect specimens when the sun was down as they sat on the grass. One or two *Chærocampa porcellus* were also taken on the cliff by the prison. In July I made two excursions for *Aporia cratægi*; on the first occasion I saw none, and, in fact, there seemed scarcely any insect-life about in the *cratægi* locality. On my second visit things were almost as bad, for I only took one *cratægi*, and that such a poor ragged female that I let her go again. I believe a few specimens have been taken this year, but they are certainly getting scarcer year by year. It seems very strange that in 1896 this insect should have been so plentiful—it was in scores—and nobody be able to throw any light as to the cause of this profusion. If the insect has been planted in this neighbourhood, as some seem to think, why does not the mau who did so come forward, and let us have particulars? Anyhow, the species is evidently dying out, and will soon need replenishing with a fresh stock. Will it be forthcoming? In August I took a few *Colias hyale* and *C. edusa*. They were to be taken on the downs, and in almost any clover-field round here, along with a few *Pyrameis cardui*. *Hyale* was the more plentiful, and varied considerably; but neither *edusa* nor *hyale* could be said to occur abundantly. I have not heard that the var. *helice* has been taken here. Some *Eremobia ochroleuca* on the heads of "ragged jack" (knapweed), and several *Aspilates citraria* and *A. gilvaria* on the downs completed my August captures. In October the ivy had its usual visitors, including *Orthosia macilenta*, *Anchocelis pistacina*, *Cerastis vacciniæ*, *C. spadicea*, *Xanthia ferruginea*, &c. A nice male *Himera pennaria* on a gas-lamp on the 26th, and a *Caradrina quadripunctata* on the 3rd inst., with an *Agrotis suffusa* on the 8th, complete my season's captures. The list is rather a poor one, owing to my time for collecting having been very limited. I should judge from what I can gather from local collectors that the season has been one of the best.—H. DOUGLAS STOCKWELL; 2, Albert Road, Dover, Nov. 24th, 1900.

NOTES FROM NORTH KENT.—My cousin, Mr. T. Mitford Cottam, and myself had about five days' collecting in the neighbourhood of Darenth Wood, Farningham, and Eynsford between June 9th and 14th, 1900. The weather most of the time was fine and hot, but we were let in for one bad storm, accompanied by terrific rain. Butterflies were fairly plentiful; we observed seventeen species. *Pieris brassicæ*, *P. rapæ*, *P. napi*, *Euchloë cardamines*, *Cænonympha pamphilus*, and *Lycæna icarus* were all common. We saw a few *Gonopteryx rhamni*, one *Argynnis euphrosyne*, one *Vanessa io*, a few *V. urticæ*, and *Polyommatus phlæas*; and captured a few *Thecla rubi*, *Lycæna argiolus*, *L. agestis*, and *Nisoniades tages*; two *Lycæna albus*, and one *Syrichthus malvæ*. The only Bombyces that we saw or captured were *Euchelia jacobææ* (one taken, others seen), *Arctia villica* (one from palings, another seen flying), *Spilosoma menthastri*, *Hepialus lupulinus* (common), *H. hectus* (few), *Bombyx neustria* (larvæ abundant), and *Drepana falcula* (few). The following moths were taken over red valerian:—*Sphinx ligustri*, *Chærocampa porcellus*, *Leucania comma*, *Mamestra anceps* (common), *M. brassicæ*, *Apamea basilinea*, *Caradrina morpheus*, *Agrotis segetum*, *A. exclamatoris*, *Noctua c-nigrum*, *Dianthæcia carpophaga*, *Hadena trifolii*, *Cucullia chamomillæ* (one), and *Plusia gamma* (abundant). We also found another *Cucullia chamomillæ*, and one *Miana strigilis* at rest; one more *Dianthæcia carpophaga* at campion, and a few *Euclidia mi* flying in the sunshine. Our only capture at sugar was one *Miana strigilis*. Thirty-two different species of Geometræ were captured. The following were obtained by beating:—*Rumia cratægata*, *Venilia macularia* (also seen very commonly flying in sunshine), *Iodis lactearia*, *Ephyra porata*, *E. punctaria*, *Asthena candidata* (common), *Eupisteria oblitterata*, *Acidalia trigeminata*, *A. ornata*, *A. marginepunctata*, *A. remutaria* (abundant), *Cabera pusaria* (common), *Bapta temerata*, *B. taminata*, *Numeria pulveraria* (one), *Panagra petraria*, *Lomaspilis marginata* (common), *Melanippe sociata* (common), *M. montanata* (abundant in Birch Wood), *M. galiata* (one), *Camptogramma bilineata* (common), *Phibalapteryx vitalbata*, *Cidaria corylata* (one). On tree-trunks we found *Tephrosia biundularia* (one), *T. extersaria*, *T. punctularia* (common), *Eupithecia exigua* (?); and two *Anaitis plagiata*, one at rest and one flying. Dusking produced the following additional species:—*Eupithecia oblongata*, *Hypsipetes impluviata*, *Ephyra pendularia*, and *Melanippe fluctuata*. The Deltoides were represented by *Herminia barbalis* and *H. grisealis*. PHILIP J. BARRAUD; Bushey Heath, Herts.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON. — November 21st, 1900.—Mr. G. H. Verrall, President, in the chair.—Mr. H. Wood, of the Old Grammar School, Ashford, Kent, and Herr Moser, of 90, Bulow Strasse, Berlin, were elected Fellows of the Society. — Mr. H. W. Andrews exhibited *Atherix crassipes*, Mg., a dipteran new to the British list, taken near Ticehurst, Sussex. Mr. Verrall remarked that the species was but little known on the Continent, and quite unexpected in England. Originally described in 1820, there was no record of its re-occurrence until 1864, and there have been only one or two slight references to it since. He added that it was a most distinct species, and, like *Leptis*, was addicted to settling upon the leaves of alder.—Col. Yerbury exhibited (a) *Anthrax paniscus*, bred from a lepidopterous pupa found in sand at St. Helen's, Isle of Wight, by Mr. Holland,

Hope Museum, Oxford. Pupa found 7th July, 1899, fly emerged 12th of the same month. Schiner records *Anthrax* as being parasitic in the larvæ and pupæ of Lepidoptera and Hymenoptera. Dr. Sharp states that M. Künckel d'Herculaïs bred *Anthrax fenestralis* (*fenestrata*?) from the egg-case of a large locust, *Ocnerodes* sp. He also exhibited (b) *Tabanus bromius*—pupa found as above, emerged 12th July, 1899, observing that *Tabanus* is generally supposed to breed in wet mud round the margin of pools; and (c) a new species of *Cordylura*, of which five males and five females were taken at Aviemore in July, 1899, and further specimens again in abundance in the same place June, 1900. Col. Yerbury mentioned also that he had sent some of them to Herr Th. Becker in Silesia, in the hope that the species would have received ere now a distinctive name.—Mr. L. B. Prout exhibited three male specimens of *Proutia betulina*, Z., and two of *P. eppingella*, Tutt, bred from larvæ taken this season in Epping Forest. He remarked that both species occurred in the same part of the forest, and the larvæ appeared to be attached chiefly to old hawthorns. Excepting in the smaller size of *P. eppingella*, no superficial difference was observable between the two species. The specimens of *P. betulina*, however, emerged about ten days earlier, the dates being July 5th, 8th, and 9th, while *P. eppingella* appeared between July 14th and 21st. Dr. Chapman said that, accepting provisionally Mr. Tutt's name of *eppingella* for the last species, as a way of avoiding the difficulty of determining whether it be the *salicolella* of Bruand or his *anicanella*, which seems more probable, or a distinct species, he might call attention to the fact that he knew of no other British males of the species, except one previously bred by Mr. Prout, and one of unknown locality in Dr. Mason's collection. It is at once distinguishable from *P. betulina* by the numerous joints to the antennæ (27 instead of 21–24, 24 instead of 18–21, if only the joints visible by their pectination outside the head clothing be counted), which are nevertheless shorter, and by the shortness of the anterior tibiæ (.21 mm. instead of .29 mm.), as well as by the less difficult characters of the colour, size, form of wing, &c.—Dr. Chapman said that Mr. Merrifield had called attention at a recent meeting of the Society to the difference in the wing markings in the pupa and in the imago of *Aporia cratægi*, and exhibited some specimens of considerable interest in relation to the question of correspondence or otherwise of pupal and imaginal wings, viz. the imaginal wings of *Aporia cratægi* removed from the pupa at a certain stage of their development. The specimens showed that at this particular stage the imaginal wings presented the markings of the pupal wing, a set of markings which are in a way the reverse of those of the mature imago. The specimens also showed that this stage was one when the imaginal wing was still so immature that it was almost impossible to handle it without producing injury and distortion. Though the markings were there, they were not produced by pigmentation, at least not by formed pigment. The dark markings of the pupal wings were represented by areas that were more transparent than the rest of the wing. The fact, he remarked, was curious enough whatever might be its minute anatomy and precise meaning. The pigmentation of dark areas, Dr. Chapman remarked, is usually the latest to develop, and here we have apparently a less development in the dark area than on the pale; and

this may be therefore a reminiscence of an ancestor that possessed these dark markings as an imago. He very much doubted this, however, partly because of the great variability of these dark pupal markings, and partly because there was no question of pigment involved. Exhibited specimens of the wings at a later stage, showed the true imaginal markings developed. The white pigment was well developed, while the dark markings were still very transparent, little pigment being yet developed on them. The solidity and firmness of these specimens showed how much later they are than the others. With regard to these effects, Dr. Chapman explained them to some extent as analogous to photographic effects. It was quite possible, he thought, that light and heat caused a differential effect through the different coloured areas of the pupa. Another specimen, Dr. Chapman thought, might throw some light on the question of supernumerary joints and limbs in insects. He had, he said, in this connection made several hundred experiments upon *Porthetria dispar* last summer, but of these had as yet only examined about a dozen, one of them being the specimen exhibited. The larval limb in this case, by some mistake, had not been cleanly amputated, but partially crushed. This was done at the last larval moult, and also probably so immediately after the moult that the parts had not yet fully expanded, still less hardened, resulting, as the specimen showed, in their remaining only partially expanded. The result in the imago was a limb in which all the parts were abnormal, even the trochanter, whilst the femur was curiously flattened out triangularly, bearing on one angle an unquestionable tibia and tarsus, and on the other a member that was no doubt an abortive tibia, since it bore at least one short spur.—A paper was also communicated on “Contributions to a Knowledge of the Rhynchota,” by W. L. Distant, and “An Account of a Collection of Rhopalocera made at Zomba, British Central Africa,” by Mr. P. I. Lathy.—C. J. GAHAN and H. ROWLAND BROWN, *Hon. Secs.*

SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—October 25th, 1900.—Mr. W. J. Lucas, B.A., F.E.S., President, in the chair. Mr. Kirkaldy, Worple Road, Wimbledon, was elected a member. Mr. MacArthur exhibited specimens of *Agrotis vitellina* from Shoreham, an example of *Amphipyra tragopogonis* with pale marginal blotches on the fore wings, and a specimen of *Hesperia (Thymelicus) thaumas* of a pale straw colour. Mr. Lucas, a specimen of the cockroach *Rhyparobia maderæ*, taken in a desk in Covent Garden Market. Mr. T. D. A. Cockerell, a photograph of a hollyhock plant as an example of the ravages of the larvæ of *Pyrameis cardui* at Raton in New Mexico. Mr. West, a series of a local homopteron, *Acocephalus brunneo-bifasciatus*, taken at Blackheath. Mr. R. Adkin, a series of the plain and banded forms of *Acidalia aversata*, bred in September from ova deposited by a banded female taken at Lewisham in July, and contributed notes on their history and variation; together with living larvæ of *Caradrina ambigua*. Mr. Mera, specimens of *Colias edusa* and var. *helice*, with intermediate varieties; very pale specimens of *C. hyale*; and a specimen of *Smerinthus populi* with the basal area of the hind wings suffused with yellow instead of dull red. Dr. Fremlin read a short paper on “Bacteria,” illustrating his remarks with a varied exhibit showing the methods of culture.—H. J. TURNER, *Hon. Rep. Sec.*

RECENT LITERATURE.

F. V. THEOBALD. *Report of Insect Pests for 1899* (1900, Journ. South Eastern Agric. Coll., 21-48; five plates and two figs.).

The life-history of the asparagus beetle (*Crioceris asparagi*) has been worked out anew and compared with the American results detailed by Chittenden. Very few insects live on asparagus in this country, and only one—this beetle—does any amount of harm. Although very destructive in America and Continental Europe, its ravages here are very slight. Its natural enemies are the larvæ and imagines of *Adalia bipunctata* (the 2-spot ladybird), which feed on the ova and larvæ of Chrysopidæ (lace-wing flies). The author considers hand-picking a sufficient remedy for small gardens, and spraying in August with arsenate of lead for larger areas.

An unknown species of thrips destroying scarlet runner beans is described and figured, and attention is called to the fact that practically nothing has been done with the British Thripidæ since Haliday's 'Synopsis,' which is now very incomplete.

Among the other notices in the Report are extended notes on the life-history of the hop aphid (*Phorodon humuli*), and the record of new pests, viz. the common cockchafer on hop, the moth *Gortyna flavago* on tomato, and the great grasshopper—*Leptophyes punctatissima*—on peach trees; the latter occurred in great numbers, many in copula, near Minster.

LEPIDOPTERA.

V. WEISZMANTEL (1900, 'Rovartani Lapok,' vii. pp. 175, and résumé 16) saw an individual of *Pieris brassicæ*, at Tusnád in the Siebengebirge, whose under side had a bright rosy-red lustre, but failed to capture it.

H. G. DYAR (1900, Entom. News, xi. 517-26, pl. xiii.) gives an account, with coloured plate, of the life-history of the remarkable Central and South American slug-caterpillar, *Sibine fusca*.

CHRIST BURGER describes (1900, Illustr. Zeitschr. für Entom. v. 330, figure) a melanic aberration of *Pieris napi* as follows:—"Upper side: Ground colour unicolorous blackish grey; in obliquely-falling light, a faint violet iridescence, especially at the base and in the dorsal cells of the fore wings. The black speck at the apex always present in typical *napi*, and the occasional black spots in cells 1 and 3 of the fore wings are altogether absent. In the middle cells the ground colour is a trifle brighter. Nervures of the hind wings not widened. Fringes of the ground colour. Under side: Colouring as above. Specks and spots absent also from the fore wings. In the middle cells and in the inner part of cells 1 and 2 of the hind wings the colouring is somewhat brighter. The first four nervures of the hind wings appear considerably widened on account of the scattered, somewhat darker, scales on both sides. This is the only character by which this specimen can be recognized as belonging to *napi*, L. Fringes of the ground colour, antennæ unicolorous black, not annulate, apex of the club bright yellow ochre. Body covered with deep black hair, legs black, eyes brownish yellow. This extremely interesting, probably unique, specimen was found last spring at Dretzel, near Gladau, in Saxony."

L. AIGNER notices (*l.c.* 331) some gynandromorphs lately captured near Budapest:—(1) *Pieris daphnidice*, L., var. *bellidice*, O. Right ♂, left ♀, abdomen ♀. (2) *Colias hyale*, L. Right ♂, left ♀, abdomen ♂. (3) *Lycena bellargus*, Rott. Right ♂, left ♀.

G. W. K.

OBITUARY.

LE BARON MICHEL-EDMOND DE SELYS-LONGCHAMPS.—Almost simultaneously with the century has ended a career which lacked in length but twelve years of the century itself—that of the veteran Belgian entomologist, the Baron Michel-Edmond de Selys-Longchamps. Though born in Paris (May 25th, 1813), Liège had long been his home, and in connection with the district in which he lived the Baron held from time to time most important positions politically. His worth as a man of science was attested by his election on May 7th, 1841, as *correspondant* of the Académie Royale de Belgique. He became a member of the same in December, 1846, and was chosen Directeur de la Classe de Sciences in 1854 and in 1879. Amongst other recognitions of his work was his election as honorary fellow of the Entomological Society of London in 1871.

De Selys' name will always be associated with his labours in connection with the Odonata (dragonflies) as an authority on which order he has long been in the foremost rank. At the beginning of the century these insects were almost utterly neglected, and what little knowledge of them existed was in great confusion. The work of De Selys, however, ably assisted as it has been by that of Mr. R. McLachlan, Dr. H. A. Hagen, and a few others, has now placed this branch of entomology in such a position that those who take it up have a solid foundation on which to build.

There remain to attest De Selys' great activity over two hundred and fifty works and articles of greater or less length and importance, most of them having been published by the Belgian Academy and other learned societies. They cover a wide range of subjects; but the bulk of them treat of the Odonata. In 1840 appeared the 'Monographie des Libellulidées d'Europe,' this being the same year in which T. de Charpentier's 'Libellulinae Europææ' saw the light. The latter, an *édition de luxe* with forty-eight well-coloured plates, savours of the old school, however, while the work of De Selys is of the new. The 'Monographie' was followed ten years later by a supplement, which holds at least equal importance with the original work—the 'Revue des Odonates ou Libellules d'Europe'; in this De Selys had Dr. Hagen as collaborator. The long list of his writings contains detailed synopses and monographs of several of the subfamilies of the dragonflies of the world, as well as lists and monographs of these insects for numerous restricted areas—all being contributions of the first importance to our knowledge of the Odonata.

With the death of the venerable Baron on Tuesday, December 11th, 1900, at the ripe age of 87, the world of entomology is the poorer by the loss of a prolific and careful writer, and a most genial correspondent.—W. J. L.

WE have to announce, with very sincere regret, that JOHN HENRY LEECH died on December 29th last, at his residence, Hurdcott House, Salisbury. A further notice will appear in the February number.

The funeral will take place on Thursday, January 3rd. A train leaves Waterloo for Dinton Station at 9 a.m., returning from Dinton about 3 o'clock.



Yours very truly
J H Leach

JOHN HENRY LEECH.

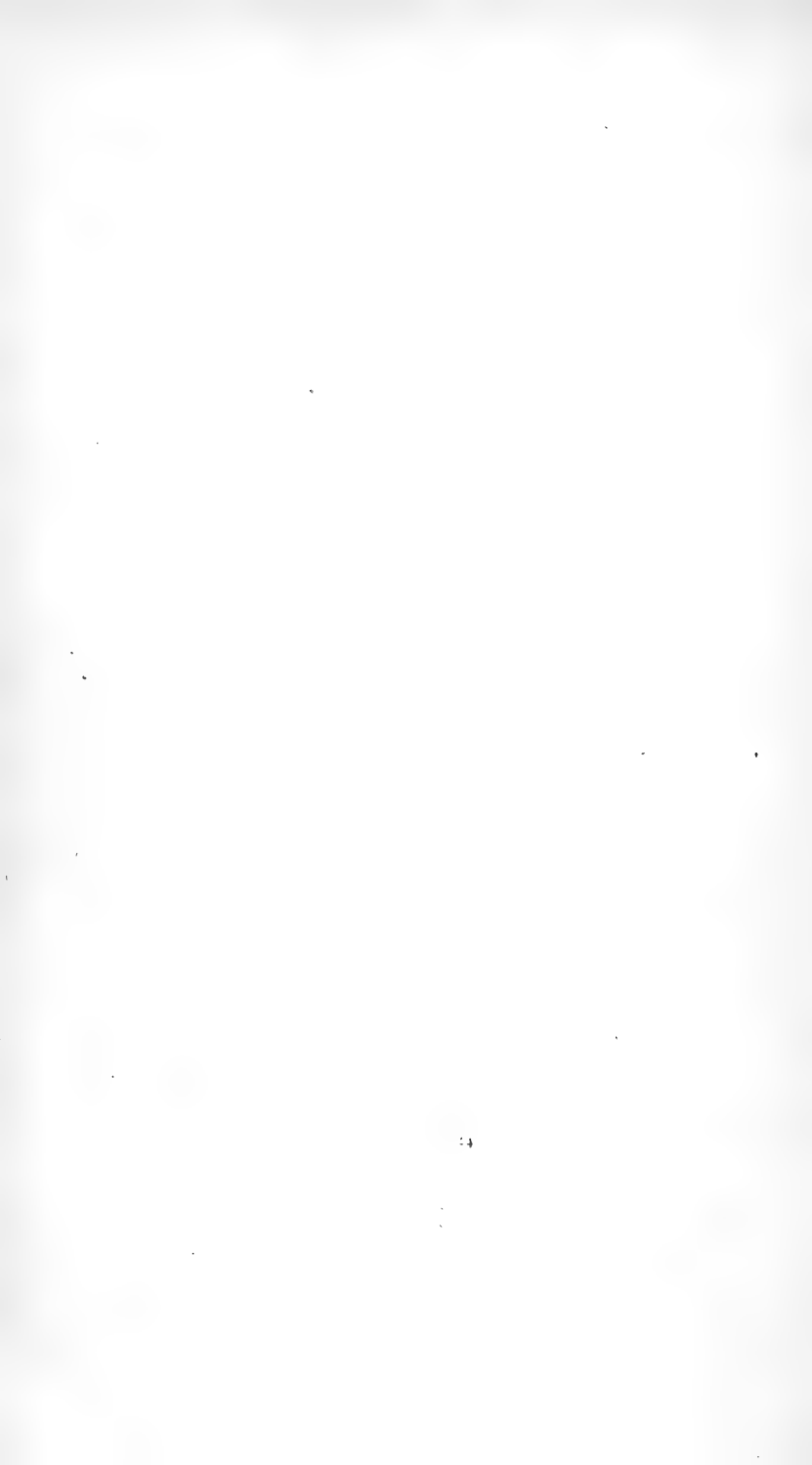
Born December 5th, 1862 ;

Died December 29th, 1900. ♠

AGED THIRTY-EIGHT YEARS.



**An Earnest Student of Nature ; a Staunch and
Generous Friend.**



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[No. 453.]

THE LATE JOHN HENRY LEECH.

MR. J. H. LEECH, whose death we briefly announced in our last number, was the eldest son of the late Mr. John Leech, of Gorse Hall, Dukinfield, Cheshire, and of Mrs. Leech, of 4, Kensington Palace Gardens. He was educated at Eton and at Trinity Hall, Cambridge, where he took his B.A. degree. Quite early in his boyhood he evinced a strong passion for all kinds of natural history objects, and later he commenced to systematically collect and to study both Coleoptera and Lepidoptera. Although he had lost his left hand, the result of a gun accident in his college days, he was able to net and to box or bottle insects in the field almost or quite as deftly as before the misfortune occurred.

His first attempt to give practical effect to his views respecting the purpose and utility of a collection was in 1886, when he was chiefly interested in British Lepidoptera. He then published 'British Pyralides,' a book in which all the Deltoids, Pyralides, Crambi, and Pterophori, known at that date to occur in these islands, were each represented by a coloured figure. No doubt he would have produced similar works on the other neglected groups of moths if he had not about that time devised a very much more ambitious scheme in the interests of science. This was no less than the exploration of Japan, Corea, and certain untried or little known parts of the North-western Himalayas, and of Central and Western China. This plan was no sooner matured than it was put into execution, and from 1886 to 1893 there was a steady accumulation of entomological material in his museum from the countries mentioned. After 1887 he did not, himself, again collect abroad, but commenced to work out and to publish papers on the Lepidoptera he had met with in his travels, or had received from his collectors; and he continued to find pleasure in these labours up to almost the last month or so of

his regrettably short life. His *magnum opus* was 'Butterflies from China, Japan, and Corea,' a sumptuous work in three volumes, which will probably remain the standard authority on the subject for many years to come.

At one time Mr. Leech possessed a very large collection of Coleoptera. In 1889 or 1890, however, he decided to devote the whole of his attention to the formation of a collection of Palæarctic and Eastern Asian Lepidoptera, and he then discarded the beetles, and these passed into the museum at Tring. In amassing the lepidopterous material from which his collection has been built up he never for one moment allowed the matter of cost to deter him from the attainment of his desires. Independent of minor acquisitions of British Lepidoptera, he purchased several continental collections, among which were those of G. d'Emmick (Buda Pesth), Dolman (Denmark), M. Sand (Central France), and Mützell (Berlin). The latter, for which somewhere about one thousand pounds were paid, was well known for its fine series, especially of Butterflies, Sphinges, and Bombyces, and the very large number of aberrations comprised therein. Selections of Amurland species were also obtained from Dieckman, and of Central Asian Lepidoptera from Tancre and Grum-Grshimailo.

The following chronological account of the various entomological expeditions personally undertaken by Mr. Leech, or organised and equipped by him, will convey some idea of the very thorough and comprehensive manner in which he carried out any work that he took in hand:—

In 1885 he, assisted by Mr. Meek, collected, with grand results, in Morocco, Canary Isles, and Madeira. In 1886 he commissioned Mr. Pratt to collect in North Syria, whilst he himself started on a journey to Corea and Japan. Arriving at Foochau, in Eastern China, about the beginning of April, he secured the loan of a houseboat from a friend, and proceeded to explore the Yuen-fu and Min rivers, and to investigate the insect fauna of the adjacent country. From Foochau he went north to the Snowy Valley, near Ningpo, a locality which had previously been found rich in insect-life by the late W. B. Pryer. Here he obtained accommodation in a Buddhist monastery, and stayed for a week or so, instructing during the time a native, whom he left to collect during the season; he then continued his journey to Japan. Nagasaki, in the southern island of Kiushiu, was the first Japanese locality visited, and there Lepidoptera were found abundantly wherever there was suitable—*i. e.* uncultivated—ground. A small native-built vessel was obtained, in which he visited the islands and parts of the western and southern coasts of Kiushiu, collecting with the greatest diligence wherever there seemed to be any prospect of success. Early in June he reached Fusan, Corea (but not in the native boat), where he was considerably hampered in his movements on account of cholera,

which he fortunately escaped, but which, by reason of the quarantining and fumigating that he was subjected to, caused him endless trouble then and for two months afterwards in Japan. After a short stay at Gensan, where his assistant, Mr. Smith, was left to collect, he returned at the end of June to Nagasaki, and thence commenced to travel, chiefly by land, to Yesso, the northern island of Japan, arriving at Hakodate on Aug. 5th. From the latter place he visited Nemoro and the Kurile Islands, but the results, from an entomological point of view, were not satisfactory, and he returned to Hakodate, finally making his way to Yokohama, *via* Sendai on the east coast of Central Japan, and reached that city at the end of September. Here he met the late Mr. Henry Pryer, whose extensive collection of Lepidoptera (less a portion of the "Micros") and Neuroptera he purchased *en bloc*. Before returning to England native collectors were engaged to work in Corea and the island of Kiushiu during the following year.

In 1887 Mr. Lionel de Nicéville accompanied Mr. Leech in his travels through the North-west Himalayas, when a large collection of Lepidoptera was made, and some very interesting species obtained, among them being several new to science, which have since been described by Sir George F. Hampson in his 'Moths of British India.' Some of the experiences connected with this trip appear to have been of a somewhat hazardous character, as, for example, when working among the glaciers of Baltistan, at an altitude of 18,000 ft. or thereabouts, *Parnassius charltonius* was met with. The nature of the locality did not afford anything in the way of a comfortable, not to say safe, camping pitch. Mr. Leech, however, being aware that this species, and also *Colias eogene* and some other desiderata, were to be had in this inhospitable situation, was determined not to move far from the spot without obtaining a good series of each species. The coolies were therefore set to work to level out a space so that the tents might be fixed up; this was accomplished, and two or three days were spent on the mountain side, and the coveted quarry secured, the series of *C. eogene* including some most remarkable aberrations. In 1887 also Mr. Pratt was engaged by Mr. Leech to proceed to China, with special instructions to investigate the insect fauna of the Yang-tze Valley. This he did for two seasons, and when Herr Kricheldorf, a German collector, was sent out to assist him in 1889, they, together with a number of natives, journeyed into Western China, and explored the country almost up to the Thibetan frontier; a second journey was made in 1890. In 1888 Mr. W. H. McArthur was commissioned to collect in parts of the North-West Himalayas, and was away two years, returning with a very fine collection. In 1891 Capt. B. Thompson went out to the ground previously worked by Mr. McArthur;

collecting was carried on by natives in China, Japan, and Syria, and consignments were received from Capt. Young, of Sullanpore, Kulu.

Mr. Leech also went to South America in 1884, and collected on the Amazons, but the material, largely Micro-Lepidoptera, and mostly obtained at Para, was not kept by him. On one journey inland the whole party was attacked by yellow fever, and several of his followers died.

Not only was it due to Mr. Leech's great activity and lavish expenditure that many collections have been enriched by the additions thereto of species of which only one or two examples were previously known, but our knowledge of the insect fauna of Eastern Asia has been considerably increased by the results of his commendable enterprise. Over one thousand species of Lepidoptera have been described by him, and a very large number of other insects, as well as Lepidoptera, have been made known to science by various specialists to whom the material obtained either by himself or his collectors was submitted.

At the close of 1889 he purchased the 'Entomologist.' One of his objects in acquiring proprietorship of this Journal was that he might have a ready means of publishing papers on the insects he was then receiving from his collectors in China. Although those papers in no way trespassed upon the space usually available for matters connected with British Entomology, a certain section of the readers considered themselves justified in raising objections to their publication in the Journal. The consequence of this antagonistic feeling, which was largely fostered by the ungenerous comments of a contemporary, was that Mr. Leech, in 1892, almost entirely withdrew from the 'Entomologist,' and transferred his right in it to the then, and present, editor.

Mr. Leech was elected a Fellow of the Linnean Society in 1884, of the Zoological and Geographical Societies in 1885, and of the Entomological Society of London in 1887. He was also a member of the following continental Societies:—Société Entomologique de France (1888), Entomologischen Verein zu Berlin (1889), and Gesellschaft Iris zu Dresden (1890).

For about two years Mr. Leech had been troubled with asthma and bronchitis, and rather over a year ago he was advised that one lung was slightly affected; but he was not thought to be seriously ill until a very few hours before the end. The malady assumed an acute form on the evening of Dec. 28th, and he passed away peacefully in the early hours of the following morning.

His death creates a void in the entomological world which may not be readily filled, and he will be greatly missed by all who had the pleasure of knowing him personally. The writer of this memoir, who for over thirteen years had the privilege of

being associated with him in his entomological work, will ever hold him in tender remembrance.

The following are Mr. Leech's contributions to entomological literature :—

- 1879.—Coloured Paper for Cabinet Drawers (Entom. xii. p. 256).
 1880.—Variety of *Polyommatus phlaeas* [var. *schmidtii*] (Entom. xiii. p. 278).
Charocampa celerio in the Isle of Wight (Entom. xiii. p. 280).
 1881.—How Insects cross the Channel (Entom. xiv. p. 19).
 Abundance of *Lithosia rubricollis* (Entom. xiv. p. 158).
 1882.—A Day's Collecting on Ben Tigh (Entom. xv. pp. 269–271).
 1884.—A Fortnight's Collecting in Sicily (Entom. xvii. pp. 133–136).
 1886.—British Pyralides, including the Pterophoridae, pp. i–viii and 1–122, pls. i.–xviii.
 1887.—On the Lepidoptera of Japan and Corea: Pt. I. Rhopalocera (Proc. Zool. Soc. Lond. 1887, pp. 398–431, pls. xxxv. xxxvi.)
 1888.—On the Lepidoptera of Japan and Corea: Pt. II. Sphinges and Bombyces (Proc. Zool. Soc. Lond. 1888, pp. 580–655, pls. xxx.–i.)
 On a Collection of Lepidoptera from Kiukiang (Trans. Ent. Soc. Lond. 1889, pp. 99–148, pls. vii.–ix.)
 1890.—New Species of Lepidoptera from China (Entom. xxiii. pp. 26–50, 81–83, 109–114, 187–192).
 Two Days' Collecting in Normandy (Entom. xiii. pp. 223–227).
 Five Days' Collecting in Normandy (Entom. xxiii. pp. 228–290).
 Collecting on the Northumberland Coast (Entom. xiii. p. 292).
 1891.—New Species of Lepidoptera from China (Entom. Suppl. pp. 1–6).
 New Species of Rhopalocera from North-west China (Entom. Suppl. pp. 23–31).
 Descriptions of New Species of Geometridae from China, Japan, and Corea (Entom. Suppl. pp. 42–56).
 New Species of Rhopalocera from Western China (Entom. Suppl. pp. 57–61, 66–68).
Sirex gigas in Ireland (Entom. xxiv. p. 248).
 1892.—Lepidoptera in the Black Forest, Germany (Entom. xxv. p. 218).
 1893.—A New Species of *Papilio* and a new form of *Parnassius delphinus* from Western China (Entom. Suppl. p. 104).
 1894.—*Sesia myopiformis* at Kensington (Entom. xxvii. p. 245).
 1892–1894.—Butterflies from China, Japan, and Corea, pp. i–lv and 1–181, pls. i–xlii., and map and other illustrations.
 1896.—Uniformity in Setting (Entom. xxix. pp. 269–272).
 1897.—On Lepidoptera Heterocera from China, Japan, and Corea (Ann. and Mag. Nat. Hist. (6), xix. pp. 180–235, 297–349, 414–463, pls. vi. and vii.) [Epicopiidae, Uraniidae, Epiplemidae, Geometridae.]
 On Lepidoptera Heterocera from China, Japan, and Corea: Pt. II. (Ann. and Mag. Nat. Hist. (6), xix. pp. 543–573, 640–679; xx. pp. 65–110, 228–248, pls. vii. and viii.) [Geometridae.]

- 1898.—Lepidoptera Heterocera from Northern China, Japan, and
 Korea: Pt. I. (Trans. Ent. Soc. Lond. 1898, pp. 261-379).
 [Sphinges and Bombyces.]
 New Species of *Syntomis* from China (Entom. xxxi. pp. 152-154).
- 1899.—Lepidoptera Heterocera from Northern China, Japan, and
 Korea: Pt. II. (Trans. Ent. Soc. Lond. 1899, pp. 99-219).
 [Bombyces.]
- 1900.—Lepidoptera Heterocera from Northern China, Japan, and
 Korea: Pt. III. (Trans. Ent. Soc. Lond. 1900, pp. 9-161).
 [Cymatophoridæ and Noctuidæ.]
- Lepidoptera Heterocera from Northern China, Japan, and
 Korea: Pt. IV. (Trans. Ent. Soc. Lond. 1900, pp. 511-663). [Noctuidæ.]

FURTHER NOTES ON SINHALESE RHYNCHOTA.

BY G. W. KIRKALDY, F.E.S.

Fam. TETIGONIIDÆ.

Tribe GYPONINI [= subf. GYPONINA, Stål.].

This tribe has been in a chronic state of fluctuation as regards its components; at present, however, it may be regarded as distinguished by the generally flat and horizontal vertex, two basal ocelli, antennæ remote from the eyes, juga usually considerably expanded, posterior lobe of intermediate coxæ without an acute spine.

EOGYPONA, gen. nov.*

Closely allied to the American *Gypona*, Germ. Head clypeate, not foliaceous, subhorizontal, slightly inclined upwards apically, subhemispherical, subangular apically, lightly carinate medianly longitudinally; frons: basal half tumid, widely but superficially sulcate medianly longitudinally, the apical half consists simply of a narrow carina. The antennæ are situated about midway between the lateral margins of the head and the frons; the first segment of the peduncle is not so wide compared with the second, as in *Gypona*. Rostrum very short, reaching to midway between anterior and interior coxæ. The genæ are greatly expanded dorsally and ventrally. Head, thorax, and elytra somewhat closely punctured. Anterior margin of pronotum slightly convex, posterior margin slightly roundly excavate; antero-lateral margin slightly longer than postero-lateral, these two forming an obtuse angle with one another. Scutellum large, subequilateral; base of metanotum rounded. Elytra: claval

* "*EOgypona*" perhaps more correctly, but the form given exceeds in euphony.

suture strongly marked, neurulation of corium very much as in *Gypona glauca* (Fabr.), but there is no membrane. The second apical area of the wings is quadrangular. Posterior femora apically bispinose, tibiæ externally with five strong short spines, tarsi short and stout. There is a somewhat elevated *transverse* carina extending across the sterna, separating the anterior and posterior lobes of the intermediate coxæ. Connexivum ventral, subvertical, strongly developed. Type, *E. kirbyi*, Kirkaldy,

This genus is distinguished from its American ally by the form of the head and of the antennæ.

1. *E. KIRBYI* (Kirkaldy).

†*Gypona* (?) *kirbyi*, Kirk., 1900, Entom. p. 294.

†*Gypona striata*, Kirby, 1891, nec Burmeister, 1835.

In the female the 6th abdominal segment is convexly rounded apically, and not excavated as in most species of *Gypona*. The head is shorter and squarer than in *E. walkeri*, being 5-angulate, while in *walkeri* it is triangulate.

E. WALKERI (Kirkaldy).

†*Gypona* (?) *walkeri*, Kirk., 1900, Entom. p. 294.

†*Gypona prasina*, Walk., nec Burm.

In the female the 6th abdominal segment is straight apically, the 7th being enormously long in proportion to the others.

Fam. FULGORIDÆ.

EODELPHAX, gen. nov.*

Belongs to subf. Asiracinæ (Delphacinæ of authors). Vertex nearly square, depressed inwardly, the lateral margins forming a sharp carina extending alongside the inner margin of the eyes as far as the intero-posterior angle of the latter, which extends posteriorly almost as far as to the base of the pronotum. These carinæ are continued forward to the apex of the head, forming a right angle there; the part of the vertex anterior to these carinæ is depressed inwards, declivous, and rounded marginally. Vertex feebly carinate medianly longitudinally. Frons long-oval, truncate at each end, carinate (with clypeus) medianly; clypeus long, triangular. Antennæ prominent, very large, first segment compressed and dilated, obliquely triangular, the interior side longer than the exterior; second segment slightly longer than the first, compressed, very tuberculate. Eyes latero-ventrally deeply grooved medianly to admit the cariniform first segment of the antennæ during repose. Rostrum reaching to posterior coxæ. Pronotum slightly narrower apically than the base of the head,

* "*Eos*" in this combination and in "*Eogypona*" has reference to "dawn" as applied to the Oriental Region, not as supposing an ancestral form, as in *Eohippus*, &c.

expanded broadly about as far as the exterior margins of the eyes, feebly tricarinate; scutellum longer than head and pronotum together, feebly 5-carinate. Tegmina extending far beyond apex of abdomen, the majority of the nervures somewhat closely granulate. Legs simple, posterior tibiæ trispinose. Type, *E. serendiba*, Kirkaldy.

Somewhat closely related to *Pundaluoya*, Kirkaldy.

E. SERENDIBA, sp. n.

Subfuscous, hyaline, tegmina obscurely marked with dark brown, three small spots on the interior margin of the clavus, and some irregular ones on the membrane. The legs—especially femora—antennæ, &c., chequered with blackish brown. Venter dirty stramineous. Length, $7\frac{1}{2}$ mill.

♀. Only the first (apparent) ventral segment is entire, the ovipositor extending backwards as far as the apex of the (apparent) third.

Pundaluoya, October, 1898 (E. E. Green).

FORCING *AGROTIS ASHWORTHII*.

BY ROBERT TAIT, JUN.

AFTER failing for two years in succession, I have again been successful in forcing *Agrotis ashworthii*, and have been able to get the perfect insect to emerge in exactly nine weeks from the hatching of the ova.

I paid a visit to the Penmaenmawr locality on July 21st, and found the perfect insect over, notwithstanding the late season. By careful searching, however, I secured a couple of batches of ova, and also found the remains of several batches which had already hatched. I again visited the spot a few days later, and found a few more ova, bringing my take up to about a hundred and thirty. They began to hatch on July 23rd, and as I was not returning home for another week, they were kept in a small flower-pot, covered with fine loam, and supplied with sawdust, which was kept fresh by being in water.

I returned home on July 30th, and at once divided the larvæ into four batches, putting them into medium-sized flower-pots, and placing them on the kitchen mantelpiece. I then had one hundred and twenty-five larvæ, and they fed well on sawdust until the end of August. Some of them fed up much more rapidly than others, and when they were nearly full grown I removed them to a roomy cage, with earth for them to pupate in, and kept them on the wooden covering of a hot-water cylinder. As they grew, I gradually moved them from the flower-pots to this cage, and they soon began to disappear in the soil provided for them.

About the middle of September the sallow began to fail, and those larvæ which were then left were given lettuce. This, however, did not agree with them very well, and, after about seventy had pupated, the remainder either died off or absolutely refused to feed.

On September 30th, or exactly nine weeks from the ova, the first imago emerged, and they continued to do so until November 9th, when the last specimen appeared, making sixty-two in all. I examined the remaining pupæ and found them dead, probably having been damaged when removing them from the earth in order to take them with me when I had to leave home for a week in October.

The largest number which emerged on one day was seven, on October 9th, and, though I have one or two small ones, there is not a single cripple. I found that they emerged at all times, from early morning to late in the evening, and rarely moved after their wings had dried. As soon as this had taken place they settled in some corner or crevice in the cage, just as they do in a state of nature. They never flew at night, and, although I left several which came out late, they were perfectly fresh the next morning.

I am inclined to think that the insect is sluggish by nature, and this will probably account for its being so seldom taken at sugar. I have sugared regularly in its haunts, when I have taken it at rest during the day, but have only caught three specimens by this method.

The bred specimens vary considerably, and range from the palest dove colour to a dark slate colour, with intermediate forms, having a dark band on a light ground.

I think my success in rearing the species was due to the fact that the larvæ were put into warm quarters soon after hatching. On previous occasions they were kept for about a fortnight before the forcing commenced, owing to my absence from home.

One thing about *A. ashworthii* which puzzles me is that batches of ova are laid in small tufts of grass among the rocks, yards away from growing plants of any kind, so that either many of the larvæ must perish from hunger, or else they must be great travellers. The former appears very probable, as in my experience the number of imagos to be found in any season is not proportionate to the number of ova laid. The female deposits the ova in batches of from twenty to fifty, and, if only half of the larvæ lived, the insect should be quite plentiful in most seasons.

15, Rectory Road, Crumpsall, Manchester: Dec. 15th, 1900.

THE OLDEST EXISTING MOTH.

By F. W. FROHAWK, F.E.S., M.B.O.U.

I RECENTLY received for examination a moth which is undoubtedly the oldest existing specimen, probably about one hundred years older than any now in existence. It was found last October, compressed between a document written in Mexico in the year 1650, dealing with the sale of land. This, with others written at the same period, and relating to similar transactions, were all wrapped in a leather covering and stored away, as I understand, in a government locker, with other ancient deeds. These documents had remained untouched since the time they were written and stored away, two hundred and fifty years ago, until last October, when the specimen now figured was found



completely flattened between its folds. The moth is so much flattened that it is obvious that the document was folded up with the specimen inside, so there remains no doubt whatever that it did not enter afterwards, as that would have been an impossibility.

The finder, not being accustomed to handle such delicate objects, unfortunately damaged both wings on the right side, and broke off the antennæ, otherwise it would have been quite perfect. The colouring is in a wonderful state of preservation, being beautifully fresh. Not finding the specimen represented in the British Museum or in other large collections, I sent a sketch of the moth to Mr. Herbert Druce, who kindly identified the species for me as *Rhododipsa miniana*, Grote, belonging to the family Acontidæ; the type described from Northern New Mexico is in the collection of Prof. Snow, at Lawrence, Kansas. It was described by Grote in "Papilio," vol. i. p. 175 (1881), and figured by him in vol. ii. pl. i. (1882). My friend Dr. Butler writes me: "The figures in 'Papilio' are rather rough, and the neuration is not given, so that a really good figure with neuration would be useful."

The specimen is a female. The primaries have the ground colour ochreous buff, each crossed by two whitish bands; the first near the base is slightly curved and bulging in the centre, the second beyond the middle is zigzag; there is an apical crescentic spot of brilliant rose-red, a very small dot of the same colour at the hinder angle, also traces of others indicating a submarginal series; secondaries are bright rose-red blending into pale ochreous along the costal area, fringes yellowish, head, thorax, abdomen, and legs all pale ochreous, antennæ missing; as shown in the figure of the neurulation, the discoidal cell of the secondary is open, and partly so in the primary.

January, 1901.

OPORABIA AUTUMNATA AT HOME.

By J. E. R. ALLEN, M.A.

THE various forms occurring in the genus *Oporabia* have been very fully described, in all their stages, by Mr. Prout, but not much has been said concerning the habits of the insects in their wild state. My experiences in hunting *O. autumnata*, during the years 1898–1900 may therefore be of some interest.

During my first three seasons at Enniskillen, I did not find *O. autumnata*, though specimens had been taken by both Colonel Partridge and Captain Brown. My failure was, no doubt, due to the somewhat restricted habitat of the species. In 1898, putting together hints received from Captain Brown and Mr. Prout, I tried a plantation of tall alder trees in a private demesne near Enniskillen. I soon found some *Oporabia* larvæ, which seemed to be different from those which I had previously been taking. The first difference noticed was that the alder larvæ were more backward in growth; afterwards I noticed that not one of them showed any trace of purple markings, while the larvæ beaten from oak and whitethorn (chiefly the latter), in an adjacent open park, separated only by a thorn hedge from the alder plantation, included a fair proportion of purple-marked individuals. The alder larvæ in the early stages had indistinct yellow stripes in addition to the spiracular line, but in the last stage they were of a uniform green but for the spiracular line, and practically indistinguishable from the whitethorn larvæ, except when the latter showed the purple stripe.

The two lots of larvæ, from whitethorn and alder, were carefully kept separate, and maintained their difference of growth throughout. A number of the former and a few of the latter were full-fed about May 14th; some of the former were feeding up to May 31st, some of the latter up to June 10th; the former emerged September 24th to October 7th, the latter September 24th to November 6th. I should add that I had sent away a few of the earliest of the whitethorn larvæ, otherwise

the dates for these would have been a little earlier. The two series of moths were easily distinguishable, both by colour and by the direction of the median line on the fore wings. The alder-bred moths were silvery-grey, varying in depth, but never approaching brown, with the median line bent at a right angle about a fourth of the distance from the costa. Those bred from whitethorn were brown, with the median line irregularly waved and dentated.

From September 30th to October 5th I took a few moths in the alder plantation, all resembling those bred from alder. I disturbed them by jarring the trunks of the trees, but they often flew from one tree to another, without descending low enough for the net. None were seen at rest on the trees, and no females were taken. An attempt to hunt the moths by lantern light proved a failure.

I submitted all these specimens to the inspection of Mr. Prout, and his reply satisfied me that I had two distinct forms, the alder-bred specimens being *autumnata*, and the whitethorn-bred *dilutata*. In 1899 I did not keep any larvæ, except a few found on birch (which I failed to rear), and a part of a small brood of *autumnata* from an accidental pairing in captivity. These began to hatch March 22nd, and took to whitethorn so readily that I never offered them any other food. I reared ten specimens, all closely resembling the parents.

In 1900, I found the larvæ fairly common in another alder plantation, near the former one, consisting of lower trees, and therefore easier to work. The moths bred in this year show a much wider range of variation, some being very dark, like the specimens figured by Mr. Prout in Entom. xxxiii. Pl. I., figs. 12 to 15, while one resembled fig. 5 on the same plate (var. *sandbergi*). The most interesting circumstance was that I bred an unmistakable *dilutata* from the alder-fed larvæ; also a yellowish specimen, which Mr. Prout refers to his var. *christyi* of *dilutata*. The larvæ from the two plantations were not kept separate, and I suspect that these larvæ came from the new plantation, as I also captured a few *dilutata* in this plantation. In the original plantation I had this year a curious instance of the way in which the two forms keep within their respective bounds. From a small hazel tree growing in the midst of the alders I beat a few larvæ, one with conspicuous purple marks. I kept these separate, and the moths turned out to be typical *dilutata*. I also reared this year two *autumnata* from larvæ taken on birch, but in the midst of the alder plantation. Of these two, one was the lightest and the other almost the darkest I have ever bred. I have never known *autumnata* to stray away from the alder plantations. All the moths taken at street-lamps in the town, and in other parts of the district, are most obviously *dilutata*. A few specimens which were taken at a short distance from the *autumnata* localities, and which I once thought might be

autumnata, are referred by Mr. Prout to *dilutata* var. *christyi*. In addition to bred specimens, I captured a fair number of *autumnata* this year. Of the captured specimens only one was a female, and only one was seen at rest on an alder trunk. All the others were disturbed from the alders, as in 1898, though this year they seemed not to fly so high.

A few notes on *O. filigrammaria* by way of contrast. It occurs on the open moors in Lancashire, and may be found at the end of August and in the first half of September, at rest on stone walls, where it is easily captured without net. I believe it may also be taken at dusk. It is smaller than *autumnata*, and runs into glossy dark brown forms, such as do not seem to occur in *autumnata*, though the lighter forms of *filigrammaria* resemble *autumnata* very closely. The larvæ of *O. filigrammaria* hatch early in February. They have in all stages distinct yellow stripes in addition to the spiracular line, differing in this respect from *O. autumnata*, though, like it, they never show any trace of purple marking.

CARADRINA AMBIGUA IN HAMPSHIRE.

BY J. HY. FOWLER.

DURING the last week in September I put about a dozen females of *Caradrina ambigua* in a box amongst primrose leaves, and succeeded in obtaining some hundreds of ova, which were deposited indiscriminately upon the leaves and on the sides of the box; the ova were very small, pale yellowish white. The larvæ hatched out in about sixteen days' time, and were long and thread-like, at first dark brown grey in colour, and hairy. As they grew to full size they became much less hairy; they had two hairs upon each segment, forming a row lengthwise upon each side of the dorsal stripe, each hair placed upon a slight pale tubercle; the spiracles black and hairy; numerous very short grey hairs scattered about the body also.

When full grown the larva is just an inch long, stout, and only slightly tapering towards the head; it is several shades of brown and grey, underneath a little paler than the sides, lateral stripe semi-double and yellow, bordered broadly dark brown with fine black lines, which radiate into the dorsal stripe; dorsal stripe light brown, narrowing towards the head, latter small and shining brown, divided by a yellow V, which contains a black dot in the middle. The first three segments are more or less dark all over; on the upper surface is an interrupted white line bordered with dark brown, followed by eight arrow-head markings, the barbs being hair-like, with the terminals having distinct dots; the anal spot is long and centred with paler. I

supplied the larvæ with plantain and groundsel; they eat each plant readily. They commenced to pupate on November 20th, amongst the rootlets of the groundsel, upon the surface of the earth, and between plantain leaves; one spun a neat cocoon of dark grey silk upon the muslin cover. When spun upon the soil the cocoon is soft and loose, but tough. The larva does not change for over a fortnight after spinning; the pupa is nearly white at first, gradually changing to a lively light red. I have over a hundred pupæ, so far, and many larvæ of all sizes still feeding.

As previously mentioned (Entom. xxxiii. 272), I took this species upon the wing in abundance during September; it occurred upon clematis flowers right up to October 21st. Some nights scarcely any were seen, others it was plentiful; three of us obtained over eighty one evening; worn ones were numerous and unmolested.

It is usually stated that this second brood is smaller than the first, but this does not seem to be correct, as most of mine quite equalled them in size. The only difference I find is that they are much darker; the shades of grey in fresh specimens vary considerably; a few are uniformly dark, with stigmata and lines indistinct; some are mottled grey, stigmata clear, lines distinct and strongly dentated; others are quite brownish, in fact a few would pass for *C. blanda* were it not for their white hind wings; one or two very pale and yellowish, quite fresh, but all specimens as they get old are extremely pale, and with ragged fringes. The best I took is very light all over, with thorax and body nearly white. The hind wings vary also; a few females are brown all over, others have the nervules dark, also the borders of the wings, the latter narrowly edged with a clear yellow line before the dark fringes; in most specimens the centre of the wings contain a remnant of a line, generally three or four dots, which are more conspicuous in this species than any other of this group that I am acquainted with.

The stigmata vary very much; in some specimens that I have, they are of nearly equal size, some very large and clear, one scarcely showing any at all; but most are filled in with a slightly darker shade than the ground, the only exceptions being the pale varieties, and the dark reddish specimens.

Upon the clematis flowers there were many large grey spiders roaming about in search of prey, and it does not seem possible that they could manage to catch and hold such large game as a *Caradrina*, but many an *ambigua*, and even one *P. meticulosa*, fell victims to them. I saw in many instances a moth being firmly held by the head, the part the spider always attacks; it kills the moth, and eats out the interior, leaving only the wings and abdomen. The *meticulosa* was very lively, but did not escape.

Ringwood, Hants: January, 1901.

MARGINAL WING BRISTLES IN LEPIDOPTERA.

BY AMBROSE QUAIL, F.E.S.

IN the present article I do not make an exhaustive enquiry into the subject, and although not previously observed by me in my examination of the wings while studying the neurulation—maybe the bristles have been destroyed when the wing scales were being removed—it seems impossible that they have been overlooked by others. Incidentally, I have read a good deal that has been written in reference to wing structure in the Lepidoptera, but I cannot recollect a record hitherto, and such works as are available make no reference to the presence of erect marginal bristles at regular intervals on the wings of certain Lepidoptera.



I first noticed them while preparing drawings of wing scales for illustration by lantern in a recent local lecture.

Having examined different species amongst the Geometræ and observed the bristles to be present, I selected a British specimen of *Melanippe fluctuata* to demonstrate the existence of the bristles. This species has considerable affinity to the antipodean *Asaphodes megaspilata*, on which I first observed them.

The bristles once observed are very noticeable, and remind one of the smooth setæ of some larvæ. So far as my observations go they rise from the upper surface in the Geometræ; they are erect, not perpendicular, but nearly so; smooth and apparently circular in section, and taper from a substantial base to a fine curved point—the curve directed inward away from the fringes. At the base of the bristles is a round elevated “button,” several

diameters larger than the cavities into which the stems of the wing scales are inserted. On the fore wings the bristles may be observed near the base of the costal edge, and at regular intervals along the costa, round the apex and the outer edge, to near the extremity of the first cubital nervule; there are none beyond this point, nor on the inner margins of the fore wings. On the hind wings, the first bristle may be observed at the extremity of the first radial nervule, and they occur at regular intervals to very near the anal nervure.

The wing scales are of entirely different structures, and are horizontal to the surface of the wing; the fringe scales continue the horizontal plane beyond the margin of the membrane. All round the margin of each wing, the scales are inserted into cavities, very close together, and there are at least three rows of such parallel to each other. The bristles are so far removed from the extreme margin of the wing that they are inner to the second row of scales, and between each of the bristles, according to the distance apart, there are from nine to twenty-one scales in each row. The bristles are wider apart on the costal margin than they are on the outer margin of the wing.

Many species of *Geometræ*—*Boarmia repandata*, *Hybernia leucophearia*, *Cheimatobia brumata*—rest with wings expanded, and touching the surface of tree trunk, branch, paling, or what not, on which the insect may be during day-time; but observe these same insects at night, either settled or in copulation, and the wings are erect. I have seen them so during the day-time, and remember, on at least one occasion, speculating as to why the erected wings were not blown apart by the strong wind which was blowing direct on to the edges. I would now suggest—in fact, it seems obvious—a function of the marginal bristles is that of fastening together the edges of the opposite wings when they are erect. It is probable that the normal action of the muscles at the base of the wings is to expand them, and the ability to keep them erect is largely helped by the marginal bristles.

Noctuæ—*Orthosia macilenta*, *Caotcala nupta*, *Mamestra brassicæ*—have the marginal bristles. *Mamestra* (*Melanchra*) *mutans* (N. Z. sp.), which I have just examined, has stronger bristles, with a more pronounced curve, than most *Geometræ*; in Noctuæ, however, the marginal bristles rise from the under surface of the wing. Clearly, the function ascribed to the bristles among *Geometræ* does not apply to the Noctuæ. Here is a problem which I will leave to anyone who feels sufficient interest in the subject, and will merely remark that the marginal bristles occur in both male and female of *Asaphodes megaspilata*, and is probably not a sexual character.

Palmerston North, New Zealand: Sept. 1st, 1900.

NOTES ON SOME RHYNCHOTA COLLECTED CHIEFLY IN
CHINA AND JAPAN BY MR. T. B. FLETCHER. R.N., F.E.S.

BY G. W. KIRKALDY, F.E.S.

My friend Mr. Fletcher's very limited opportunities for entomological work while with H.M.S. 'Centurion,' on the China Station, were chiefly directed towards the acquisition of Lepidoptera, so that the Rhynchota, which he has kindly added to my collection, are but few in number, though of some interest. The following is a preliminary list. (P)=probably in Palæarctic region; (O)=probably in Oriental region. Castries Bay is just south of the mouth of the Amur; Kama Kura is close to Yokohama; Kornilof is in the north-east of Cho-sen (as, I believe, Korea ought properly to be termed); Leu-Kung-tao is an island near Wei-hai-wei; Port Lazareff, in Cho-sen, near Gen-san; and Pei-tai-ho, near Shan-hai-Kwan, in the Gulf of Leao-tong.

My thanks are due to my amiable friend, Dr. Arnold L. Montandon, who has been so kind as to examine the species marked with an asterisk (*).

Fam. TETIGONIIDÆ.

1. *Tetigonia ferruginea* (Fabr.). Cho-sen, Port Lazareff, Oct. 2nd, 1897 (P).

Fam. CERCOPIDÆ.

2. *Aphrophora* sp.? China, Castries Bay, Sept. 8th, 1896 (P).

Fam. CICADIDÆ.

3. *Pycna kæmpferi* (Fabr.). Japan, Yokohama, Aug., 1898 (P).
4. *Graptopsaltria colorata*, Stål. Japan, Yokohama, Aug. 1898 (P).
5. *Dundubia* (subg. *Cosmopsaltria*) *opalifera*, Walker. Japan, Kama Kura, Aug. 1898; China, Leu-Kung-tao, Aug. 1898 (P).
6. *Cicada bihamata*, Motschulsky. Japan, Hakodate, Aug. 1897 (P).
7. *Cicada flammata*, Distant. Japan, Hakodate, Aug. 1897 (P). As Mr. Distant was acquainted with the female only (Mon. Orient. Cicad., p. 99, pl. 13, fig. 15), the following details are added. Belongs to Distant's section A. a. bb., and looks somewhat like a large broad *bihamata*, being perhaps intermediate between the latter and *leechi*, Dist. Anterior femora armed with two very strong spines; opercula reaching beyond the middle of the abdomen, overlapping interiorly, rounded apically. Last two "abdominal" dorsal segments spotted with reddish-ochraceous, first genital segment above not spinosely produced in the middle.
8. *Cryptotympana pustulata* (Fabr.). China, Wei-hai-wei, July 16th, 1898 (P).

9. *Cicadetta*, n. sp.? Japan, Kornilof, July 9th, 1899 (P). Almost certainly a new species, but only one female in the collection; allied to *C. pellosoma* (Uhler), from China.

Fam. FULGORIDÆ.

10. *Geisha distinctissima* (Walker) (P).

11. *Pyrops* [= *Fulgora*, auct.] *candelarius* (Linn.). China, Hongkong, Mar., 1898, April 22nd, 1899; Kaulung, Dec. 1898 (O).

Mr. Fletcher has been good enough to send me a copy of his observations on this insect, recorded at the time in his Journal: "Sometimes they were on the trunk [of the tree], with which they harmonize very well, and sometimes high up in the branches; in the latter case, they are easily beaten out, and then fly quite a distance, their vivid yellow hind wings rendering them very conspicuous on the wing. . . . A tree at the top of the [Botanical] Gardens [at Hongkong], with a Chinese coolie gesticulating under it, attracted" Mr. Fletcher's attention, and he found a pair of *candelarius* "settled on a branch, with whose environment they harmonized well." Mr. Fletcher insists on the harmony of *candelarius* with its environment, but Mr. E. E. Green's account of the Sinhalese *maculatus* is very different. "Our *Pyrops maculatus* is a very conspicuous insect, when at rest, and takes no measures to conceal itself, trusting to its marvellous agility" (E. E. Green in litt. Aug. 22nd, 1900).

Mr. Fletcher also tells me that the people at Kaulung had never heard of *candelarius* being luminous. I asked him also if he could afford any solution as to the use or purpose, if any, of the cephalic prolongation, and if this were any assistance in flying, but Mr. Fletcher emphatically denies this. "When alive, the long 'nose' is quite soft and fleshy, and they do not seem to mind bending it up at all, as it straightens out again afterwards. They walk almost on the tips of the two first pairs of legs, with the head up, keeping the third pair close to the body, and with these they can give a long leap, the wings then sustaining the flight" (Journal, in litt. Dec. 10th, 1898); and again, "Generally speaking, they fly up into the leaves, high up, when disturbed. They use their legs awkwardly, and walk in a gingerly kind of way. I found that on a flat surface, such as a desk, they could leap about three feet with the hind legs. . . . They are very wary and suspicious when settled, and are easiest to catch on the wing, or, better still, just when they have settled, before they have got their bearings, so to speak" (in litt. July 5th, 1900). Mr. Fletcher suggests that the cephalic prolongation may possibly serve to resemble a twig of the tree on which it is resting.

Fam. BELOSTOMATIDÆ.

12. **Amorgius deyrollii* (Vuillefroy). China, Yang-tze-Kiang, Aug., 1898.

13. **Amorgius indicus* (Lep.-Serv.). Siam, Bangkok (O), flew to light on board the 'Centurion,' about twenty miles from land, Dec. 3rd, 1899.

Fam. NEPIDÆ.

14. **Nepa cinerea*, Linné. China, Chi-fu, May 9th, 1899, in a stream (P).

15. **Ranatra unicolor*, Scott. China, Pei-hai-to, Sept., 1898 (P). Dr. Montandon remarks:—"Cette espèce est bien voisine de *R. vicina*, Sign., mais en diffère par les yeux plus globuleux, aussi longs que larges, moins transversaux, l'espace interoculaire un peu plus rétréci; les deux épines du milieu du fémur antérieur plus espacées; l'extrémité du fémur antérieur non épineux. Les pattes, les élytres et le métasternum sont conformés de façon à peu près identique. Chez *R. vicina*, Sign., les deux épines du fémur antérieur situées à l'extrémité du tibia au repos sont presque sur le même plan transversal" (*in litt.* Oct. 11th, 1900).

16. **Ranatra chinensis*, Mayr. Cho-sen. Dr. Montandon writes me:—"J'ai aussi dans ma collection un exemplaire semblable du Japon reçu jadis de MM. Staudinger, sous le nom de *Ranatra princeps*, Westw., nom que je ne connais pas et qu'il faudrait vérifier" (*in litt.* May 19th, 1900). The publication of this name is unknown to me also.

Fam. GERRIDÆ.

17. *Metrocoris lituratus* (Stål). China, Hongkong. "Common in pools and streams on the hills," but only one pair captured, March, 1899 (O).

18. *Gerris fletcheri*, sp. n. Very closely allied to *G. najas* (De Geer), Kirk. [*paludum* (Fabr.), auctt.], but is scarcely so robust, and a trifle longer. The general structural characters are those of *najas*, but the second segment of the antennæ is distinctly longer, in proportion to the third, than in that species, and, in the female, the first genital segment is wider in proportion. In colour, the pronotum is more or less rufescent, and the elytra are pale fuscous, dirty whitish at the base, with dark brown nervules. Had *najas* (*paludum*†) been recorded from Siberia or Japan, I would probably have regarded this as a local form of it, but it seems to be sufficiently distinct by the characters given above.

China, Wei-hai-wei, May 20th, 1899 (P). I have great pleasure in naming this addition to the Palæarctic fauna after Mr. Fletcher.

Fam. REDUVIIDÆ.

19. *Peirates*, sp. China, Wei-hai-wei, May 27th, 1899.

† I have demonstrated in *Entom.*, 1899, p. 203, that the true *najas*, De Geer, is identical with *paludum*, Fabr.; the *najas* of authors is *canaliculatus*, Dufour.

Fam. GEOCORIDÆ [= LYGÆIDÆ, auctt.].

20. *Dindymus sanguineus* (Fabr.). China, Hongkong, March, 1899 (O).

21. *Physopelta gutta* (Burm.). China, Hongkong, March, 1899. Common on trees (O).

22. *Geocoris colon* (Fieber). China, Wei-hai-wei, June, 1899 (P).

Fam. LYGÆIDÆ [= COREIDÆ, auct.].

23. *Myodocha varicornis* (Fabr.) [*Leptocoris* v. auct.]. China, Hongkong, March, 1899. On a small flower above the cemetery in Happy Valley.

24. *Mictis profana* (Fabr.). Australia, Sydney.

25. *Megalotomus*, ? sp. In company with (probably mimicking) ants. China, Wei-hai-wei (P).

Fam. CIMICIDÆ.

26. *Tectocoris lineola* (Fabr.). Australia, Sydney.

27. *Tessarotome papillosa* (Drury). China, Hongkong, Dec., 1898 (O). Mr. Fletcher writes me, that when attempting to capture this, the bug, which was then about sideways to him, squirted some fluid into his right eye, the somewhat considerable pain lasting about half an hour. He also writes: "When irritated, it quivers its antennæ rapidly, emits a most powerful odour [from the thorax], and squeaks plaintively."

28. *Pycnum rubens* (Fabr.). Labuan, Oct. 25th, 1899 (O).

29. *Catacanthus nigripes* (Sulz.). Australia, Sydney.

30. *Dictyotus vilis* (Walker). Australia, Sydney, Jan., 1898. Agrees with examples received from New Zealand, from Mr. Ambrose Quail, F.E.S.

31. *Philia senator* (Fabr.). Australia, Sydney.

32. *Cantao ocellatus* (Thunb.). China, Hongkong, Mar., 1899 (O). A little smaller and darker than Western oriental forms.

33. *Graphosoma rubrolineatum*, Hope. Cho-sen, Korniloff, Aug. 9th, 1899 (P).

NOTES AND OBSERVATIONS.

EMERGENCE OF *DREPANA BINARIA* (*PLATYPTERYX TRAMULA*) EXTENDING OVER THREE MONTHS.—In June of last year I obtained ova of *P. hamula* from a captured female, and succeeded in rearing seven larvæ to the pupal stage. From these pupæ two males emerged on Aug. 1st and 4th; four more emerged on Nov. 9th, 14th and 26th, and Dec. 19th. The pupæ have been kept in an open box out of doors, I shall be glad to know if this prolonged emergence is unusual, and if any of your readers have had a similar experience.—LEONARD A. SPENCER; 52, Burghley Road, Highgate Road, N.W., Jan. 5th, 1901.

THE STRIDULATION OF *CORIXA*.—I received, by the kindness of the author, a copy of Anton Handlirsch's "Zur Kenntniss der Stridulationsorgane bei den Rhynchoten" (1900, *Annalen Naturh. Hofmus.*

Wiën, pp. 127-141; 1 plate and 15 text-figures), but, unfortunately, it was too late to stop my own brief communication last month (page 9), or to add a footnote. As Handlirsch's conclusions do not altogether accord with mine, I hope very soon to discuss his valuable and interesting paper.—G. W. KIRKALDY.

SWAMMERDAM ON THE DRAGONFLY NYMPH.—In connection with Mr. Calvert's note in Entom. xxxiii. p. 350, it is interesting to find that Swammerdam wrote in 1680:—"The limbs (*i. e.* of the dragonfly nymph) come out of the egg imperfect." He further states that he does not know how long a period elapses between the laying of the egg and its hatching, nor how long the nymph-stage lasts, though he thinks the latter is two years—a result which Mr. East arrives at in the case of *Æschna cyanea* (see Entom. xxxiii. p. 258). The insect that Swammerdam subjected to examination appears to have been a species of *Gomphus*. I have made use of the English translation of his work, 'Biblia Naturæ,' by Dr. J. Hill, in 1758. By the way, eggs of *Symptetrum striolatum* hatch in captivity in three or four weeks.—W. J. LUCAS; Kingston-on-Thames.

NOTES ON BRITISH DRAGONFLIES.—*Ischnura pumilio*. This pretty little dragonfly was taken by my father, near Lyndhurst, in August, 1820; on Parley Heath, June 18th, 1824; on Knighton Heath, near Dorchester, in July, 1835; at Glanvilles Wootton (two only), Aug. 17th, 1859. In a bog near Land's End (commonly), in August, 1864, by my father and myself; at Lodmore, near Weymouth (one specimen at least), in May, 1887, by myself. It is recorded by Mr. Henry Doubleday as occurring in old gravel pits at Epping (Ent. Monthly Magazine for 1871-1872, p. 87). It has also been reported from Cambridgeshire and Ireland (see De Selys Longchamps' paper on British Libellulidæ in 'Annals of Natural History' for 1846).—*Agrion mercuriale*. One taken by my father, in the New Forest, on June 12th, 1832; subsequently, at Winchester, on June 17th, 1832; and at Cosmore Quay, about two miles from here, on July 1st, 1839, and July 6th, 1844.—*Æschna rufescens (isosceles)*. This grand fellow was taken by my father, at Whittlesea Mere, on June 22nd, 1818, and July 18th, 1827, by Mr. Sparshall, at Horning, on Aug. 5th. 1824. It has also been reported from Halvergate and Yarmouth. The latter is probably a mistake, as the species is omitted from Paget's 'History of Yarmouth.'—*Libellula veronensis*. Mr. Lucas gives this as = *S. scoticum* (see Entom. xxxiii. p. 260). I possess the specimen, and it decidedly is not *scoticum*, but the true *vulgatum*. De Selys Longchamps saw it in August, 1851, and told my father he was right. It was taken at Hull by Mr. Harrison.—*Agrion zonatum* (Entom. xxxiii. p. 260) is *cyathigerum*. The late Baron de Selys came over to England to view the collection, specially of Curtis and Evans, and as the result, wrote a paper on the British Libellulidæ in the 'Annals of Natural History' for 1846, vol. xxiii.—C. W. DALE; Glanvilles-Wootton, Nov. 3rd.

[Of the distribution of *Æ. isosceles (rufescens)* must give way to the prior name), *I. pumilio*, and *A. mercuriale*, a summary will be found in my 'British Dragonflies,' pp. 213, 270, and 297. The older captures of Mr. J. C. Dale and others, though mentioned there as being

extremely interesting, are of little practical use to the present-day field naturalist. There are, however, two by Mr. C. W. Dale himself—of *I. pumilio*, near Land's End, in 1864, and of the same insect near Weymouth in 1887—but a later search in the latter locality only revealed *I. elegans*; while, if my memory serves me rightly, Mr. C. A. Briggs sought in vain for *pumilio* at Land's End. Of course, this does not prove that the last is not now to be found in these two localities, for, besides the fact that *pumilio* is a very inconspicuous insect, both species of the genus may fly together, as is the case in the locality discovered last season in the New Forest. By the way, this can scarcely be the part of the forest in which Mr. J. C. Dale took *pumilio* in 1820—it is too far from Lyndhurst. With regard to *veronensis* (Entom. xxxiii. p. 260), the name given by Curtis is *Lib. veronensis*, Charp., and the *veronensis* of Charpentier is certainly *Sympetrum scoticum* (vid. Lib. Eur. p. 85 and pl. xii.). De Selys, in his 'Revue des Odonates' (1840), says:—"Je n'ai pas vu l'exemplaire pris à Hull en Angleterre et cité sous le nom de *veronensis* par M. Curtis; mais M. Dale, qui le possède, m'écrit que c'est probablement la vraie *vulgata*, d'après la forme de l'écaille vulvaire." (See also Ann. Nat. Hist. 1846.) As it appears the insect was examined afterwards (in 1851) by De Selys, it is a pity his opinion seems never to have been published, especially as three specimens of *S. vulgatum* have been taken in England during the last few years.—W. J. L.]

EVENING FLIGHT OF BUTTERFLIES.—In reply to Mr. Blenkarn's query (*ante* p. 26) as to the twilight flight of *Pyrameis* (*Vanessa*) *cardui*, I should say it is not a very unusual occurrence. I have few back volumes of the magazines at hand to refer to now, but I think that Mr. E. F. Studd, amongst others, has recorded taking this species and *P. atalanta* in his moth-trap at night. Indeed, the *Vanessids* especially seem to have a tendency to nocturnal flight. On July 19th, 1899, when we were at Korniloff, in Korea, a specimen of *Vanessa v-album* came off to the ship, attracted by light; and in 1897, when we were there, I took three specimens of the same species at light on board; these all came to light about ten p.m. It struck me as a strange thing that I never saw any on shore there in the day-time, though it must have been fairly common. At home, of course, we look on butterflies as essentially creatures of the sun, but it must be remembered that in many genera abroad the species fly only at twilight; at Hongkong, for example, though I have taken *Lethe europa* on the wing in the day-time, I have found that its flight is much swifter in the evening after sunset, and it seems, so to speak, much more at home on the wing then.—T. B. FLETCHER; H.M.S. 'Gladiator,' Mediterranean Station, January 12th, 1901.

XYPHIDIA CAMELUS.—This rare sawfly was taken by my father, in the New Forest, on June 23rd, 1840. My other specimens were taken by Mr. Serrel, in the Isle of Man. Mr. Wailer used to find it common at Newcastle. It probably still exists in the New Forest, and only awaits re-discovery, like *Ischnura pumilio* and *Mecostethus grossus*.—C. W. DALE.

INSECT FAUNA OF MIDDLESEX.—I shall be greatly obliged if any collectors who have made observations and captures of Lepidoptera, or

any other orders, will send me their lists, with a view to assist in a compilation of records for Middlesex (only), particularly in the south-western districts of the county.—H. ROWLAND-BROWN; Oxhey Grove, Harrow Weald, Middlesex.

NEW WORK ON BRITISH DIPTERA.—The first volume of 'British Flies,' by G. H. Verrall, President of the Entomological Society of London, was issued on January 1st of the present year. The work when completed will extend to some fourteen volumes. The book now before us is vol. viii., and treats of the Platypezidæ, Pipunculidæ, and Syrphidæ. A more extended notice will be given in the next number of the 'Entomologist.'

LIST OF BRITISH SPIDERS.—The Rev. H. Pickard-Cambridge, author of the 'Spiders of Dorset,' has recently published a 'List of British and Irish Spiders.' We have much pleasure in introducing this useful brochure to the notice of all who are interested in British Araneidea.

ORTHOPTERA.—Redtenbacher has published a monograph of the Orthoptera of Austria-Hungary and Germany, with general notes on the structure and development; collection and preparation of specimens, literature, analytical tables, and descriptions, &c., of the species. ('Die Dermapteren und Orthopteren von Oesterreich-Ungarn und Deutschland.' Vienna, 1900. 148 pp. and one Plate.) A detailed notice will appear later.—G. W. K.

REVISED LIST OF CHESHIRE LEPIDOPTERA.—The President of the Chester Society of Natural Science has appointed a small committee, consisting of Mr. J. Arkle, Dr. Herbert Dobie, Mr. R. Newstead, and myself, to revise and extend Mr. A. O. Walker's List of the Macrolepidoptera of the district, published in 1885. The district will now comprise Cheshire, Flintshire, Derbyshire, Carnarvonshire, and Anglesea. I should be much obliged to any one interested in the entomology of these counties, especially the Welsh ones, if they will send me records or notes; and I will supply lists for marking to those who may apply to me for the same.—Geo. O. DAY; Knutsford, Cheshire, January 22nd, 1901.

CAPTURES AND FIELD REPORTS.

ACHERONTIA ATROPOS IN SUFFOLK.—It may be of interest to record the capture of twenty-six larvæ of *A. atropos* at Stowmarket, Suffolk, during July and early part of August last, by my friend Herbert Graves of that town. They were found chiefly on the tea-vine. They pupated in flower-pots, which he placed on the top of a steam-boiler, and on Sept. 28th, 1900, the first imago emerged; they continued coming out till the end of October, viz. fifteen perfect imagos, eight cripples; there were also two dead pupæ, and one pupa is lying over. My friend sent me on six perfect insects, one fine female measuring $5\frac{1}{2}$ inches across the wings; the others are also very fine.—H. W. BAKER; 20, Alsen Road, Holloway, London, N.

ACHERONTIA ATROPOS IN N. STAFFORDSHIRE.—*A. atropos* has been abundant in the larval and pupal stages in the Market Drayton district this autumn. About twenty larvæ were brought to me, and nearly two hundred pupæ, by men digging potatoes. One hundred and seven were found and

brought me from one farm. This, of course, represents only a small proportion of the actual number of pupæ, as the machine only turns over the ridges without disturbing the furrows.—F. C. WOODFORDE.

COLIAS EDUSA IN N. STAFFORDSHIRE.—On Sept. 13th I saw and captured a male *C. edusa*. This was the only specimen I personally saw, though I heard of several being seen by others in the neighbourhood.—F. C. WOODFORDE.

COLIAS EDUSA IN N. WALES.—In the first fortnight of June I saw two or three female *C. edusa* on the Carnarvonshire coast. I caught and examined a couple and set them free.—F. C. WOODFORDE.

COLIAS EDUSA IN 1900.—A few specimens of *C. edusa* have occurred in this neighbourhood. One was seen by my wife in our garden at Newtown towards the end of July; and several more turned up a couple of miles further up the Severn valley. On Aug. 31st I saw a fine male on the roadside, on the border of Montgomeryshire and Salop. I also observed specimens of this butterfly near Northampton, in August; and one male specimen in Lincolnshire, near Bigg, on Sept. 12th.—A. S. TETLEY; Newtown, N. Wales, Dec. 15th, 1900.

MACROGLOSSA STELLATARUM AT CRANBROOK, KENT.—This species was again very common during last season; several could be seen at once on a large bed of scarlet geraniums and a large bed of petunias, in a nursery garden near here. A specimen was seen as late as Nov. 27th, although the early part of the month had been very wet and windy.—A. MARSHALL; Cranbrook, Kent, Jan. 18th, 1901.

NONAGRIA NEURICA VAR. *DISSOLUTA*, *Treitschke*.—Several examples of this black variety of *N. neurica* were taken in the neighbourhood of Needham Market, Suffolk, in August last. This is a fresh locality, I believe, for this species. The Rev. E. N. Bloomfield, in his Catalogue of the Lepidoptera of Suffolk, gives Lakenheath and Lowestoft only, and says it is local and rare.—GERVASE F. MATHEW; Dovercourt, Essex, Jan. 9th.

HEMEROBIUS STIGMA (*LIMBATUS*) IN DECEMBER.—On Dec. 16th last, I took from a small fir-tree on Esher Common, a single specimen of *H. stigma*. It was rather small, and the wings somewhat darker than usual. It must, I suppose, be looked upon as an early arrival owing to the mild weather, rather than a late survival.—W. J. LUCAS.

CHÆROCAMPA NERII IN SCOTLAND.—Mr. And. Adie Dalglish, of Pollockshields, records a specimen of this fine hawk-moth as having been taken by "a farm servant, who saw it alight on a sheaf of corn in a field near Barrhead, about the end of September." He adds that a specimen, previously recorded, was taken in September, 1886, at Glasgow (Ann. Scott. Nat. Hist., No. 37, p. 52).

CLEORA GLABRARIA IN SCOTLAND.—Referring to the note under this heading, *ante*, p. 21, it may be worth recording that I have taken this species several times in Argyllshire during the last four years, in each case during the first fortnight in August. These Scotch specimens do not appear to differ in any respect from those I have taken in the New Forest. JOHN A. NIX; 20, Hans Place, S.W.

VANESSA POLYCHLOROS IN 1900.—I have not seen in any of the magazine notices of 1900, with the exception of the 'Entomologist,' that *V. polychloros* has attracted any attention. This appears to me curious, for although of late years it has scarcely been seen where formerly it occurred pretty freely, in East Kent last season it was far from uncommon: Folkestone, Dover, Shepherdswell, Wingham, Walmer and Deal, Sandwich, Margate, Canterbury, have all to my knowledge yielded specimens, and in most cases series, to net wielders; and friends have informed me that it has been common at Norwich, Surrey, Hants (New Forest), and Devonshire too.—**SYDNEY WEBB**; 22, Waterloo Crescent, Dover, Jan. 3rd, 1901.

VANESSA ANTIOPA IN SURREY, 1900.—I am able to add one more to the list of captures of *V. antiopa* during 1900. A very poor specimen was caught on a window at Englefield Green, Surrey, about Sept. 1st. It was given to a boy of seven years old, who had no collection, as a "Purple Emperor." When I saw it, a fortnight ago, it was indeed a pitiable sight, with a large needle through it and wings on only one side; the *bits* of the other wings had been kept—no antennæ. Though in this bad state, there was no mistaking it, and I, having patched it up as well as possible, have it now in my cabinet.—**L. M. SETH-SMITH**; Alleyne, Caterham Valley, Surrey, Jan. 11th, 1901.

VANESSA URTICÆ.—A specimen of *V. urticæ*, in good condition, suddenly appeared in the dining-room of a house here, on the evening of Dec. 26th, having probably been brought in with the evergreens used for decoration. We have also one example of the same species, at present on the wall of the stairwell in this house, where it has been since the end of September last.—**A. MARSHALL**; Windmill Hill, Craubrook, Kent, Dec. 28th, 1900.

VANESSIDS IN 1900.—In reply to Mr. Adkin's note (*ante*, p. 17) I give the following notes of my captures. I took a number of pupæ of *V. polychloros*, suspended from tar-covered palings near Winchfield in Hants, on July 6th last, the majority of which emerged on July 16th. I also took a number of *V. polychloros* pupæ, suspended from the round rails of iron hurdles at Shoreham, Kent, on July 12th; imagos emerged on July 22nd; one was ichneumonised, a large number of flies emerging. I found *V. cardui* plentiful at Margate, Sept. 18th, flying in a lucerne field, at Crayford, on railway banks (one female full of eggs); on Sept. 7th, at Sandwich; Sept. 25th, in the lanes, at Deal; Sept. 26th, at Hythe; Oct. 2nd, in lanes; and at Worcester Park, Surrey, on July 30th. I have noticed that certain of the Vanessids seem to enjoy the neighbourhood of brick-works and gas-works, but cannot understand what it is that attracts them, unless it be the vile smells they find there. They are very fond of settling on the cinders used in brick-making, and when driven off will return to them, in preference to settling on flowers or mother earth, and there sun themselves. *V. atalanta* I found not so plentiful as in 1899, although I had been on the look-out every day in the week, right through the season. *V. io*: I have seen odd specimens at Hythe, Aug. 31st, and at Margate, Oct. 18th.—**C. W. COLTHRUP**; 127, Barry Road, East Dulwich, S.E.

I did not see, in this district, a single specimen of either *Vanessa cardui*, *V. io*, or *V. polychloros*, although *V. atalanta* was very common up to Oct. 7th, on the over-ripe fruit in this neighbourhood, where baskets of

plums, &c., were allowed to rot under the trees.—A. MARSHALL; Cranbrook, Kent, Jan. 18th, 1901.

V. atalanta has been abundant in the autumn here during the last few seasons. *V. (Pyrameis) cardui*: a few were seen in 1897. *V. io* has always been very scarce; in fact, during the last twenty-two years I have only seen four specimens. *V. (Aglais) urticae* is generally abundant every year.—G. B. ROUTLEDGE; Tarn Lodge, Headsnook, Carlisle, Jan. 8th, 1901.

V. atalanta during the past season has been more than ordinarily abundant in the neighbourhood of Carlisle, and also in the district round Lazonby, in the south-east of Cumberland. Not since 1894 have I seen it so plentiful. *V. io* has hardly been seen for a good many years until last season, when several were seen or taken near Carlisle, and near Maryport on the coast it was not uncommon, so that it is hoped that this fine species is about to re-establish itself with us. Twenty or more years ago it was, I believe, almost as common as *V. urticae*.—T. H. DAY; Carlisle, Jan. 7th.

Referring to Mr. Atkin's note (*ante*, p. 17), the following observations from Lewes and district may be of interest. The past season has been marked by an abnormal abundance of *V. atalanta*, while *V. (Cynthia) cardui* has occurred in tolerable numbers. *V. io* appears to have almost completely disappeared from the neighbourhood, since in places where it was formerly plentiful I have hardly seen a specimen for the past six years. The late Mr. Watkins, of Eastbourne, informed me that he had noticed the same in reference to the Eastbourne district. *V. polychloros*, formerly also plentiful, is now but seldom seen. I have only noticed two specimens during the past six years.—HUGH J. VINALL; Lewes.

EARLY APPEARANCE OF PHIGALIA PEDARIA (PILOSARIA).—I took a fine male (black variety) off a gas-lamp on Dec. 16th last.—W. FEATHER; 7, Harding Houses, Crosshills, Yorks.

LATE BUTTERFLIES.—I see, on referring to my notes, that I captured a male *Euchloë cardamines* on Aug. 4th, 1879. *Pararge egeria* I saw on Oct. 16th the same year. *Grapta c-album* was in my garden on Nov. 2nd this year, and at the end of the month *Pieris rapæ* was seen, on two occasions, near this city. Several days during the month were as warm as at the end of September; violets and primroses in plenty in the open.—J. B. PILLEY; Hereford, Dec. 18th, 1900.

NOTES FROM CRANBROOK, KENT.—The number of butterflies in this district seems to me to be on the decrease, and I believe this is, partly at least, attributable to the keenness of our up-to-date agriculturists for "hedge-brishing," which means that, when the hay and corn has been carried, all the hedges are trimmed up, and the herbage from the banks and ditches cleared away. These "brishings" are either burnt or thrown into the cattle-yards, which must mean the destruction of a lot of ova, larvæ and pupæ. Specimens of *Pieris napi* were in good condition up to Oct. 7th; many of the late females had the under side of the secondaries a beautiful bright lemon-yellow colour. *Gonepteryx rhamni*, *Vanessa urticae*, and *Polyommatus phlœas* were also common here up to end of September. One specimen only of *Colias edusa* seen, on Aug. 11th. Re *V. cardui* (*ante*, p. 26), one autumn, some few years ago, I several times saw specimens flying round oak-trees on some high ground near here, after sunset.—A. MARSHALL; Cranbrook, Kent, Jan. 18th, 1901.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—*December 5th, 1900.*—Mr. G. H. Verrall, President, in the chair. Mr. Jacoby exhibited specimens of *Hypocephalus armatus* from Bahia and *Chrysomela salisburyensis*, a new species, from Mashonaland.—Mr. Bower exhibited a specimen of *Spilosoma montanum*, an Asiatic species, bred from a larva found at the beginning of September, 1897, feeding on birch on a moor near Paisley. The larva hybernated and spun a cocoon the following spring, not feeding after hibernation. Moth bred June 2nd, 1898. The larva was given to Mr. Wm. Smith, of Paisley, by a friend who found it on a moor used by the Glasgow Corporation for rubbish, the supposition being that the ovum or larva had been introduced with the refuse matter.—Mr. McLachlan exhibited a female of a Dragonfly of the genus *Tetracanthagyna*, from North Borneo, similar to *T. vittata*, McLach., but with a very broad ante-apical fascia on the wings, and with some asymmetrical markings. He said there might be a question as to the specific identity or otherwise of the insect. And there was also the question as to whether the insect described by Mr. C. O. Waterhouse as *Gynacantha plagiata* in the 'Transactions' for 1878 was specifically the same. Mr. Waterhouse was of opinion that the species was distinct.—Mr. R. Adkin exhibited two aberrant male specimens of *Argynnis aglaia*. In one of them the basal two-thirds of all the wings were almost completely covered with black, and broad black streaks crossed the remaining third of the wings to the outer margin, following the venation. In the other specimen the peculiarity consisted in the presence of a greenish-white blotch on each of the wings on the left side, similar in character to the pale blotches not infrequently observed in *A. paphia*. Both specimens were taken near Brighton in July last, where the species was unusually abundant.—Papers were communicated, on "Observations on some species of *Orina*, a genus of viviparous and ovo-viviparous beetles, by Mr. G. C. Champion and Dr. T. A. Chapman," reported by Dr. T. A. Chapman; "Illustrations of the sixth male ventral segment in seventeen *Osmia* species of the *Adunca* group, with a note on the synonymy of three species, and descriptions of five which appear to be new," by the Rev. F. D. Morice, M.A.; and an obituary notice of the late Dr. Otto Staudinger, by Mr. H. J. Elwes, F.R.S.—C. J. GAHAN and H. ROWLAND-BROWN, *Hon. Secs.*

Wednesday, January 16th, 1901.—The sixty-eighth annual meeting. Mr. George H. Verrall, President, in the chair. After an abstract of the Treasurer's accounts, showing a large balance in the Society's favour, had been read by one of the Auditors, the Secretary read the Report of the Council. It was then announced that the following had been elected Officers and Council for the Session 1901-1902. President, the Rev. Canon Fowler, M.A., F.L.S.; Treasurer, Mr. Robert McLachlan, F.R.S.; Secretaries, Mr. Herbert Goss and Mr. H. Rowland-Brown; Librarian, Mr. George C. Champion; and as other members of the Council, Professor T. Hudson-Beare, F.R.S.E., and Messrs. R. Adkin, Charles G. Barrett, William L. Distant, H. St. J. Donisthorpe, Charles J. Gahan, Robert W. Lloyd, Edward Saunders, G. H. Verrall, and Colbran J. Wainwright.—The President referred to the losses the Society had sustained during the past session by the

deaths of Mr. Spence, the Baron de Selys-Longchamps, Mr. Blatch, Major George Cockle, Mr. Philip Crowley, Lord Dormer, Mr. J. H. Leech, Dr. W. H. Lowe, Professor Joseph Mik, Professor Emile Blanchard, Dr. Staudinger, and other entomologists. He then delivered an address.—A vote of thanks to the outgoing President was proposed by the Rev. Canon Fowler, seconded by Colonel Swinhoe, and carried. —H. GOSS and H. ROWLAND-BROWN, *Hon. Secs.*

SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—*November 8th.*—The President in the chair. The Annual Exhibition of Varieties was held on this evening, and was a most successful and interesting meeting. Mr. B. Adkin, a bred *Vanessa (Eugonia) polychloros* with a very pale ground colour; a *Triphæna fimbria* having the black band on the hind wings extending along the inner margin; and examples of *Catocala promissa* with paler upper wings, and hind wings with narrow and straight median band. Mr. Winkley, *Catocala nupta* var. *cærulescens*, taken in August, 1892. Mr. R. Adkin, varieties of *Argynnis aglaia* (1) with basal two-thirds black, except a yellow discoidal spot (on the under side the silver spots were reduced to two on each hind wing; (2) with greenish blotch on both left wings, similar to those frequently found in *A. paphia*; (3) with black spots on the central portion of the under side run together into irregular bands; (4) two unusually dark females, one having an unpigmented patch on both left wings; also a long series of *Melanippe galiata*, showing extreme variation in the width and intensity of the band. Mr. Urwick, a graduated series of variations of *Abraxas ulmata* from smoke-coloured to almost white; hermaphrodite var. of *Argynnis paphia*, having the right wings var. *valezina*, and the left wings ordinary male type, except a few dark splashes; a suffused var. of the same species; several vars. of *Lithosia quadra* showing variation in depth of colour and absence of spots; a sagittate variety of *Epinephele hyperanthus* and grey forms of the same species; a richly banded form of *Ephyra pendularia*; and sixteen very striking varieties of *Chelonia plantaginis*, showing a complete gradation between the extreme form with pure white ground colour and black markings to a much intensified form of var. *hospita*, being an inbred series. Mr. Nevinson, *Malacosoma castrensis* showing extreme variation; a light form of *Lasiocampa trifolii*; light and dark forms of *Cosmotriche potatoria*; *Arctia caia* with radiated black markings on hind wings; hybrids *Pygæra curtula* × *T. pigra*; light and dark *Heliothis peltigera*; a banded form of *Zonosoma linearia*; and extreme light and dark forms of *Melanippe fluctuata*. Mr. F. M. B. Carr, an example of *Diloba cæruleocephala*, in which the 8-mark is represented by two small spots; a *Coremia propugnata (designata)* with a very narrow brown transverse band, and one without a trace of the flame colour; and a male *Malacosoma neustria* with scarcely any sign of the pale transverse lines. Mr. H. J. Turner, a series of *Callimorpha hera*, taken in August at Dawlish, showing a complete gradation in colour between the rich red of the type, through the terra-cotta form to the brilliant yellow form, var. *lutescens*; and a very long and varied series of *Bryophila muralis (glandifera)* from the same place, remarkable in all the forms being dark, many of a rich yellow brown coloration, most with black markings conspicuous, and in all the hind wings were dark, and in some very dark. Mr. Adkin and Mr. Colthrup, series of the

latter species from Eastbourne and Folkestone respectively to compare with them. In Mr. Colthrup's series was a specimen with the "cottage-loaf" mark cut asunder by a broad streak of black, a most unusual form. Mr. Lucas, a series of nine *Libellula quadrimaculata*, showing a complete gradation between the type and an extreme example of the var. *prænubila*. Mr. Chittenden, a large number of varieties taken or bred mostly from Kent, including *Bupalus piniaria*, right side female, left side male coloration; dark brown *Drepana fulcula*: red, dark, and light forms of *Tæniocampa gracilis*; dark and light forms of *Pachetra leucophæa*; *Phigalia pedaria*, dark vars.; *Hybernia marginaria*, intermediate forms and var. *fuscata*; and extreme light and dark forms of *Cidaria immanata*, *Aplecta prasina*, *Xylophasía monoglypha*, &c. Dr. Chapman, a number of specimens of several European species of the genus *Erebia*, to show that the most well-marked forms tend to have black spots with a white pupil in each marginal cell, set in a bright brown band, which may invade a considerable area of the wing; while at the other extreme the dark ground colour may cover the whole wing to the exclusion of all the spots. Mr. J. P. Barrett, to show variation in size, (1) *Colias hyale*, one $2\frac{1}{8}$ in., another $1\frac{1}{4}$ in. in expanse; (2) *Ennomos alniaria*, one $2\frac{1}{8}$ in., another $1\frac{1}{8}$ in. in expanse; a pure yellow var. of *Aspilates citraria* without lines; and a specimen of the spring brood of *Agrotis putris*. Mr. H. Moore, forms of *Papilio machaon* from Greece, India, the Amur, and Japan (var. *hippocrates*); and a series of *P. xuthus* from China and Japan. Mr. A. Harrison, long and varied series of *Xanthia aurago*, *Miselia oxyacanthæ* with var. *capucina*, and *Scopelosoma satellitia* taken at sugar near Chingford in October. Mr. Main, two *Colias edusa* var. *helice*, bred from ova laid by a female *helice* taken at Hanwell. Mr. Mera, dark varieties of *Abraxas grossulariata*; and a *Cænonympha pamphilus*, having the left wing on the under side of the colour of the upper wing. Rev. J. Tarbat, very dark *Hybernia defoliaria*, small and varied *Tanagra atrata*, and bred *Stauropus fagi* from spring ova. Mr. Kemp, *Epinephele hyperanthus* (1) with apical ocelli wanting, (2) a bleached variety; and a similar variety of *E. tithonus*. Mr. Nicholson, *Catocala sponsa*, with left upper wing entirely suffused with umber-brown; *Pararge egeria*, a bred specimen thinly scaled with obscure markings; *Pieris rapæ*, with an indistinct spot on the disc of the hind wings; *Mamestra brassicæ*, of a uniform shiny leaden grey colour; and a series of *Melanippe fluctuata*, including var. *costovata*, and several banded forms resembling *M. sociata*. Mr. Cole, *Catocala nupta* var. *carulescens*, taken on sugar at Brondesbury; and a var. of *C. hyale*, with a broad elongated splash of black on the under side of the fore wings. Mr. Kirkaldy, long series of various species of waterbugs, especially *Notonecta glauca* and var. *maculata*, to show colour variation, and how unreliable it is as a specific character. Mr. Kaye, a specimen of *Papilio machaon*, with the submarginal band of the fore wings internally edged with a broad black band, and with the discoidal spot enlarged into a blotch uniting with the band; and a specimen of *Hydrocampa stagnalis*, with several of the transverse markings much diminished or obsolete. Mr. Buckstone, *Polyommatus icarus*, female, with blue right upper wing, and a specimen smaller than *Cupido minima*. Mr. Newman, *Smerinthus ocellatus*, variety; dark forms of *Ennomos* (*Eugonia*) *fuscantaria*; and a red form of *Noctua neglecta*.

Mr. Brooks, bred *Acherontia atropos*, with a very pale variety, and one with very broad and dark markings; a *Pyrameis atalanta* with a pale border on one hind wing; a black fringed *Spilosoma radiata*; a very varied series of *Melanippe hastata*: and living pupæ of the first named, which he distributed to the members.

November 22nd.—The President in the chair. Mr. Cane, of East Dulwich, was elected a member. Mr. Adkin exhibited a varied series of *Abraxas grossulariata* and contributed notes. Mr. Ashly, a long and varied series of the Coleopteron, *Onthophagus vacca*, from Willesden. Mr. F. M. B. Carr, series of *Taniocampa gothica* taken at sallow in the New Forest, at Easter, in 1899 and 1900; and a pair of *Trichiura cratægi*, bred from larvæ taken at Hailsham. Mr. Turner, a number of species of Lepidoptera and a few specimens of other orders, from Dawlish, and read notes on the fauna of that place, entitled, "Desultory Days at Dawlish in August, 1900."

December 13th.—The President in the chair. Mr. Nottle, of Lower Sydenham, and Mr. R. L. Hewitt, of Lewisham, were elected members. Mr. Turner, on behalf of Mr. Tunaley, exhibited a specimen of *Spilodes paleatis* taken in the Isle of Wight in July, with five specimens of *Acherontia atropos* bred from larvæ taken at Porlock, North Devon. Mr. R. Adkin, living examples of *Caradrina ambigua*, bred on Dec. 12th from South Devon ova, and presented them to the Society's collection. Mr. Clarke, a specimen of *Locusta viridissima* from Deal, and presented it to the Society's collection. Mr. Turner, large and well-bred examples of *Ocneria dispar*. Mr. Sich, an example of *Oporabia autumnata*, bred November 7th, from a larvæ taken on elm in Sussex. Mr. Manger, a number of species of Rhopalocera taken in and around Ladysmith, Natal, including *Pieris hellica*, *Colias electra*, *C. hyale*, *Pyrameis cardui*, *Precis sesamus*, *Teracoli johnstoni*, &c. Mr. MacArthur, a large number of *Arctia caia*, including one with very pale wings. Mr. Tutt, specimens of an Alpine form of *Polyommatus dorilis*, and made remarks on the double-broodedness of the species. Mr. Kemp, a Psocid *Clothilla studiosa*. Mr. Moore, a specimen of *Ophion luteum*, and said that he frequently took this species of Ichneumon in October and November. Dr. Chapman, a number of specimens prepared to show the various points in his paper, "Some Wing-structures in Lepidoptera."

January 10th, 1901.—The President in the chair. Mr. R. Adkin exhibited a specimen of *Hepialus sylvanus*, which he took on the downs near Birling Gap, Sussex, September 4th, while drying its wings on a plant of viper's bugloss (*Echium vulgare*), together with the pupa skin, which he found protruding from the root of the same plant. Dr. Chapman exhibited a nice series of *Argynnis thore*, an Alpine species from Pontresina, 6,000 feet. Mr. H. J. Turner, specimens of *Locusta viridissima* from Ventnor, where it was common in 1899, and a specimen of the milk thistle, *Carduus* (*Silybum*) *marianum*, found on the downs near Swanage. Mr. Montgomery, long bred series of *Colias edusa* and var. *helice*, with intermediate forms and contributed notes. Mr. Lucas, specimens of the land shell, *Clausilia laminata* and var. *albinos*. Mr. F. Noad Clarke, with the lantern, a large number of Photomicrographs of Lepidopterous ova, and contributed notes. The whole of the photographs were very skilfully produced, and were all to one scale of size.—H. J. TURNER, *Hon. Rep. Sec.*

RECENT LITERATURE.

JOHN B. SMITH. *Insects of New Jersey*. Suppt. 27 Ann. Rep. State Board of Agriculture for New Jersey for 1899 (1900, 755 pp. and 2 maps; 328 figs.).

This comprehensive catalogue is an extension of a similar list prepared some ten years ago. After introductory chapters on the development of insects, the injury caused by them, insecticides, machinery, &c., a complete list, so far as is known, is given of all the insect orders, twenty-two of these being recognized. Brief diagnoses of the families are followed by an enumeration (after each family) of the species, with localities. Three hundred and twenty-eight figures of the more noteworthy insects are inserted, either in the text or in full-page plates; most of these are from well-known sources, such as Dr. Smith's own 'Experiment Station Reports,' Riley's Missouri Reports, and those of the United States Department of Agriculture. The second map (of New Jersey, showing the location of the San José Scale Colonies) is by mistake numbered fig. 392 instead of 329.

A very useful feature, for local workers, is the "Index to Localities" (pp. 703-20), stating the best-known centres for collecting, and their characteristics. The total number of New Jersey Insecta is 8537 species, an increase of 2439 since the first edition, ten years ago: Coleoptera, with 2845; Lepidoptera, with 1570; Diptera, with 1193; and Hymenoptera, with 1718, have been the most fully worked orders.

G. W. K.

E. A. ORMEROD. *Flies Injurious to Stock* (London, 1900, 80 pp. 24 figs.).

This little work is professedly a compilation, to a large extent from the authoress's previous writings, for the use of those interested or engaged in farm-work. At the same time it contains a large amount of information anent the habits of the various British Diptera implicated, particularly *Æstrus ovis* (by misprint in list of subjects "*ovinus*") and *Melophagus ovinus* on sheep; *Gastrophilus equi*, *Hippobosca equina*, seven *Tabanidæ* and *Hypoderma* sp. on horse; and *Hypoderma bovis* on ox. The work ought to be in every British entomologist's library, and it is for this reason, and on account of the nominal price, that a longer notice is not given. The only fault of the book is the length of the extracts from correspondence, which could probably have been much abbreviated, and the gist of the matter more ably submitted to the reader in the authoress's own words.

G. W. K.

Coleoptera.—R. SCHOLZ records (1900, Illus. Geit. für Entom. 298), a beetle, *Stenocorus fasciatus*, Fabr., with monstrous abdomen. The first ventral segment is, according to the author, twisted out of its place; the second segment is smashed, part (on the left side) being anterior to the first, part (on the right side) being posterior to the first. G. DE ROSSI records (*l. c.*, 313) an example of *Geotrypes spiniger*,

Marsh., of which the left elytron is entirely red; a male example of *Ptinus brunneus*, Dft., with a round vesicle (*Blase*) on each elytron; one of *Melasoma cupreum*, Fb., which has only the rudiment of an anterior tarsus with the claw-segment; *Adalia bipunctata*, L., with the left elytron var. *herbsti*, the right var. *pruni*. In nine hundred examples of *Leptinotarsa 10-lineata*, Say, only three were abnormal.

J. JÓZSA notes (1900, 'Rovartani Lapok,' p. 152, with 2 figures and résumé 14) a monstrosity of *Carabus hampei*, Kust., collected at Deés. The left posterior femur is very strongly thickened and divided into two parts close to the apex; from each of these parts arises a normal tibia; on the upper tibia are arranged in a row the normal five tarsal segments; on the under tibia there are only two tarsal segments, the second of which is somewhat flat and pointed at the apex.

Diptera.—J. J. KIEFFER discusses the Claws and Arolia in the Diptera (1900, "Ueber die Krallen und die Haftläppchen der Dipteren," in *Illustr. Zeitschr. für Entom.*, v. pp. 337-40. Plate).

L. WEBER notices the Diptera parasitic, &c., on Man and the other "higher Mammalia") *Abh. Ber. Ver. Naturk. Cassel.*, xlv. pp. 1-20 [? sep.].

Hymenoptera.—W. POSPJELOW contributes an article on the parasites of the Hessian Fly (*Cecidomyia destructor*) in Russia (1900, *Illustr. Zeitschr. für Entom.*, 261-4; 6 figs.).

Rhynchota.—W. W. FROGGATT monographs the Australian Psyllidæ (1900, *Proc. Linn. Soc. New South Wales*, 250-302; plates xi.-xiv.); 10 genera (3 new) and 25 species (18 new) are described.

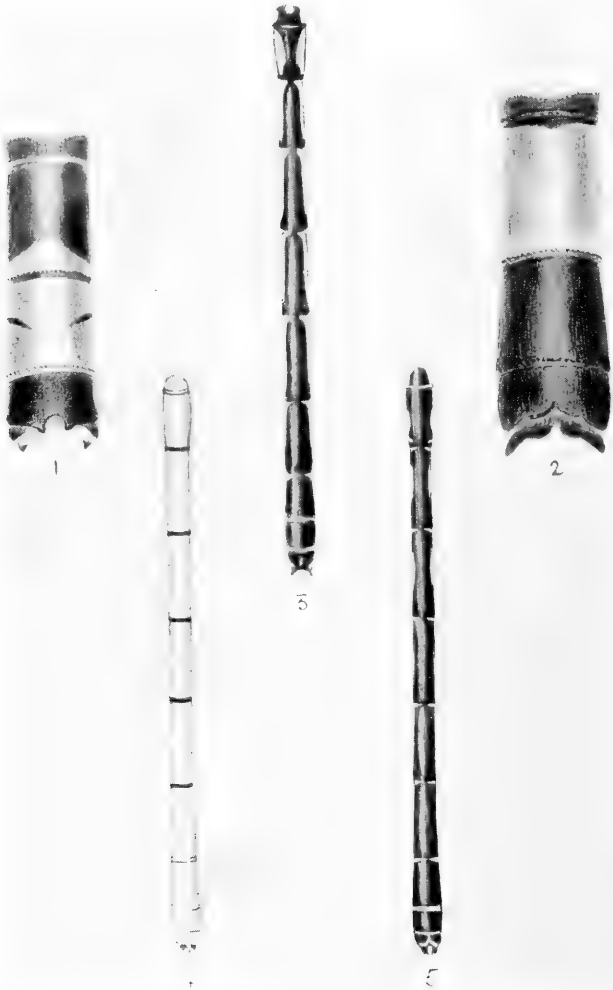
Economic Entomology.—W. W. Froggatt has lately published (1900) a number of small pamphlets on Australian Insects, in the "Miscellaneous Publications" of the Department of Agriculture of New South Wales, viz.:—

- (a) "Notes on Australian Coccidæ," no. 358, 9 pp., 1 plate.
- (β) "Plague Locusts," no. 363, 9 pp., 1 plate.
- (γ) "The Hessian Fly (*Cecidomyia destructor*, Say) and allied Grain Pests," no. 369. 6 pp., 1 plate.
- (δ) "Insects living in Figs, with some account of Caprification," no. 388, 10 pp., 1 plate.
- (ε) "Insects and Birds," no. 387; 11 pp.

Also a pamphlet—which appears from negative evidence to be a separate publication—on "Scale Insects that produce Lac"; 5 pp. and 1 plate.

Fossil Entomology.—HERBERT GOSS. "The Geological Antiquity of Insects." 2nd edition (Gurney & Jackson); 52 pp. Practically a reprint of the useful first edition published twenty years ago, with a preface embodying the more recent discoveries of Palæozoic Insects. Unfortunately the author has been unable to discuss the vast mass of information anent fossil Kainozoic insects published within the last decade by Scudder and others.

G. W. K.



W. J. Lucas, del.

West, Newman, photo-typ.

1. Anal Segments of *Ischnura pumilio* ♂ ($\times 12$).
2. Anal Segments of „ *elegans* ♂ ($\times 12$),
3. Abdomen of *Pyrrhosoma nymphula* ♀ var. ($\times 3$).
4. Abdomen of „ *tenellum* ♀ var. ($\times 3$).
5. Abdomen of „ „ ♀ var. ($\times 3$).



1



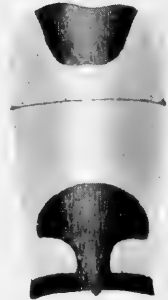
4



3



2



5

W. J. Lucas, del.

West, Newman, photo-typ.

First and Second Segments of:—1. *Agrion pulchellum* ♂ ; 2. *A. puella* ♂ ;
3. *A. hastulatum* ♂ ; 4. *A. mercuriale* ♂ ; 5. *Enallagma cyathigerum* ♂ .

All much magnified.

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ODONATA IN 1900.

By W. J. LUCAS, B.A., F.E.S.

PLATES I. AND II.

THOUGH perhaps somewhat earlier than in 1899, yet the spring dragonflies were rather slow to assume the imaginal condition. Specimens of what were probably *Libellula quadrimaculata* were certainly noticed as early as April 22nd—one in Epping Forest (A. Harrison), and another at Merton, in Surrey (J. S. Brocklesby); one or two *Pyrrhosoma nymphula* were found on Esher Common on May 5th, and at the same place, on May 13th, a male of *Enallagma cyathigerum*, and another of *Cordulia aenea*, both but just emerged; a specimen of *Libellula depressa* was secured in the New Forest on May 16th (W. J. Cross), and *Ischnura elegans* (S. W. Kemp) was taken at Acton the next day. But still it was not till the very end of May that the earlier species began to appear at all commonly, and even at the beginning of June many of them were still in a very teneral condition as regards colouring. Passing to the end of the season, *Pyrrhosoma tenellum*, which was first seen in the New Forest at the very beginning of June, was last taken on September 16th; *E. cyathigerum* (first seen May 13th) lasted a little longer, till September 22nd. *Eschna mixta* was about in some numbers on Esher Common till October 7th at least. *Sympetrum scoticum* and *S. striolatum* were seen on Esher Common on October 28th, and the last no doubt might have been found in decreasing numbers for about three weeks longer, till the middle of November, after which date I have never seen it.

No specimen of *Sympetrum vulgatum* seems to have been detected during 1900, but I have to record a male which I possess myself. It is labelled "Richmond Park, September 11th," and

was taken in 1898, but was put away unset, not being distinguished at the time from *S. striolatum*, which it so closely resembles. Males of *Sympetrum flaveolum* were again present on Ockham Common, and Major Robertson secured a male at Denny Bog, in the New Forest. No females were again detected. Should we still consider their presence due to an immigration? Dr. F. A. Walker took both sexes in Alderney in June and July. Males and females of *Sympetrum sanguineum* were taken on Ockham Common. Could it have been overlooked when for several seasons, a few years since, Mr. C. A. Briggs worked the locality so carefully? The species was received from Horsmonden, in Kent (R. South).

About *Libellula quadrimaculata* the most interesting point is a large migration noticed in the west of Europe in June. By some continental observers it was thought to have come from England. The reverse, however, was the case. At Margate, on June 10th, Mr. H. Stocks observed an immigration of what by description must have been dragonflies of this species. The same flight was also observed by Mr. A. J. Mann between Margate and Broadstairs the same day: Mr. Mann took three specimens. On June 19th Mr. G. Bolam, of Berwick, wrote to the Editor of the 'Entomologist,' saying that he had seen an immigration, presumably on July 17th: that it was of *L. quadrimaculata* was proved by the specimen forwarded for identification. Part of the migration appears to have reached Huddersfield (*vide* Entom. xxxiii. pp. 210, 247, 248). *Libellula fulva* does not seem to have been noticed during the season.

Orthetrum cærulescens was again very common in the New Forest. It was just coming on the wing during the first days of June, when one was taken (F. M. B. Carr) with lateral dark bands on the abdomen, somewhat like those in its British congener. A nymph-skin was obtained on June 5th in the company of a newly-emerged imago, and another as late as the end of July. They somewhat resemble *Sympetrum scoticum* in general appearance, but are darker and slightly incrustated with mud. Apparently they are bred in the very wet boggy ground rather than in the pools or streams. A new Surrey locality is Chobham Common (E. Vincent). A female of *Orthetrum cancellatum* was taken by Mr. D. Kirkaldy at the Broads—an interesting capture, as there have been no records of late years except from the South of England.

A specimen of *Gomphus vulgatissimus* was taken at Walton-on-Thames (A. B. Higgs), and Mr. McLachlan tells me he took several at Weybridge in 1871; many nymph-skins were also taken at Eynsham, in Berkshire (A. East). These points strengthen the position of *G. vulgatissimus* as a Thames insect. Two captures in the middle of last century (19th) have been made known for Sussex.

On June 17th a fine female *Cordulegaster annulatus* was taken on Esher Common, Surrey. It was at rest on the vegetation by the margin of the pond, and when captured did not attempt to fly. It died in the box on the way home, and when captured was, no doubt, in a moribund condition. What was its origin? But one locality in the county—Ottershaw, near Chertsey—had previously been recorded for the species. On June 3rd a male was taken in the New Forest (F. M. B. Carr) by the side of the nymph-case, from which it had recently emerged. The latter was of a peculiar appearance—broad head and tiny prominent eyes, sturdy form, and sharply tapering abdomen, hairy at the sutures. The nymph apparently lives in the mud, for the dingy skin of this specimen was somewhat encrusted with it. L. Cabot's figure of the slightly immature nymph in his "Immature State of the Odonata" gives a good idea of the full-grown form.

Anax imperator was bred on June 13th. A nymph had crawled up out of the water about 10 o'clock the previous evening, but had fallen back again into the water. In all probability it must have crawled up again very quickly, for it had emerged (a male), and was full-grown with wings expanded by 6 o'clock the next morning. By 6.30 it had flown off from its support. As regards immature colouring, head, eyes, thorax, and abdomen were in general yellowish green, but there was a slightly bluish tinge on parts of the abdomen. The costal margin of the wings and the pterostigma were pale yellow. The divisions between the segments of the abdomen were yellowish, and they were of the same colour when, a day or two later, the insect was killed. The segments themselves were then of a strange lavender-green tint. The species was as usual pretty plentiful on Esher Common, but very difficult to catch.

On June 6th *Brachytron pratense* was taken (F. M. B. Carr) at Hatchet Pond, in the New Forest. A nymph which was bred early in June remained some days with its head above water before disclosing the imago.

One of the most striking features of the season was the comparative abundance of the usually scarce dragonfly *Æschna mixta*; but so wary an insect is it, that the captures in all probability have not been really numerous. A considerable number of localities have, however, been added to the half dozen or so previously known. These are—*Surrey*: near Elstead (W. J. L.); *Sussex*: Worthing (F. Summerson); Camber Sands (? whether 1900. E. Connold); *Kent*: Shoreham (A. Buckstone); Kingsgate (H. Sauzé), Ramsgate and Hythe (C. Colthrup), Folkestone (S. Hills); *Hants*: New Forest (W. J. L.); *Dorset*: Abbotsbury (W. J. L.); *Essex*: Pitsea (H. J. Turner), Loughton (F. M. B. Carr); *Norfolk*: Cromer (S. Blenkarn), Mundesley-on-Sea (S. Kemp). On Esher Common the species was very plentiful. There may have been an immigration, but if so females came

also ; it is, however, more probably an instance of the periodical abundance of an insect without any clear reason, for early specimens were immature, and it would seem therefore must have been bred here. Has the succession of warm summers anything to do with the increase in numbers ? Rev. A. East's most interesting observations and experiments in connection with *Æschna cyanea* have been recorded in this magazine, and it will therefore only be necessary now to give the references to them (Entom. xxxiii. pp. 88, 211, 257 ; *vide* also xxxiii. p. 350, and xxxiv. p. 53). *Æschna isosceles* still awaits a rediscoverer.

Although the Channel Islands are not geographically in the British Islands, it may be well to note that Dr. F. A. Walker took *Lestes barbara* commonly in Alderney.

At the canal between Byfleet and Weybridge a few imagines of *Platynemis pennipes* were found by Mr. H. Stocks and myself, and I again bred the species from a New Forest nymph. Mr. East also took the imago by the Thames near Bablockhythe. *Erythromma naidas* was bred by Mr. F. Enock from nymphs taken at Loughton.

In the New Forest last season I captured two extreme forms of the female of *Pyrrhosoma tenellum*—one with abdomen black-bronze, the other with abdomen crimson like that of the male. For purposes of reference and description, I will call the former var. *æneatum*, and the latter var. *rubratum*. In *æneatum* (Pl. I. fig. 5) all the segments are black-bronze except narrow circlets at the sutures, which are yellow interrupted with bronze ; the ventral surface of the abdomen is yellow. Mr. A. H. Hamm took several specimens of the same form in Devonshire, at Newton Abbot and Bovey Tracey. It is probably only a coincidence that the nymph-skin of a specimen bred of this variety was perceptibly darker than the skin of a nymph which produced a normal female. Mr. J. C. Dale took this variety in Dorset (De Selys, 'Revue,' p. 181). A year or two since I took in the New Forest an intermediate form. In *rubratum* (Pl. I. fig. 4) all the segments are crimson, but there are narrow black circlets between segments 2-7 at least ; the dorsal surface of the thorax is entirely black-bronze, the face also is as in the male. I have so far met with only two or three specimens, all in the New Forest. De Selys describes this variety ('Revue,' p. 181), and refers to an intermediate form. Before leaving this species I might say that the nymph closely resembles that of *P. nymphula* in miniature. During an emergence observed on June 23rd the "rest" which lasted eleven minutes was taken with the head and thorax upright.

Pyrrhosoma nymphula has also a var. *æneatum* (Pl. I. fig. 3). The dorsal surface of all the segments is practically black-bronze, except the circlet, which is yellow, interrupted mid-dorsally with black-bronze ; the sides are yellow, and so are the markings on

head and thorax. They were taken by Mr. F. M. B. Carr and myself in the New Forest early in the season; perhaps later on the yellow might have changed to crimson; in fact, in one specimen at least it seemed to be doing so, especially towards the apex of the abdomen. De Selys, however ('Revue,' p. 179), in speaking of the same variety, describes the not-black parts as yellow.

Early last year Mr. S. A. Blenkarn brought for my inspection several dragonflies which he had taken during the previous season. Amongst them were two or three specimens of the long-lost *Ischnura pumilio*. Strange to say, in the beginning of June last year, Messrs. Carr and myself found the species in a very restricted locality in the New Forest, and between us, after diligent search on three or four days, secured eleven specimens, two only being females and both belonging to var. *aurantiaca*. It is still more strange that Mr. Blenkarn, while collecting in Abbot's Wood in July last, should capture two more examples of the same species, Mr. Blenkarn gave me two of his specimens, and some of the remainder are in the cabinet of Mr. G. T. Porritt. The most striking point of distinction between males of *I. pumilio* and its congener *Ischnura elegans* lies in the position of the blue spot near the apex of the abdomen. This will be seen better from Pl. I. figs. 1, 2, than from a lengthened description. It should be recollected that in the female of *I. elegans* the blue spot is present, from that sex of *I. pumilio* it is absent. I visited the locality in the New Forest again at the end of July, but *pumilio* was over.

Perhaps more satisfactory than the capture of *I. pumilio* is the discovery in Scotland of a species new to the British list. Amongst some dragonflies captured in Strathglass by Colonel Yerbury was a single male of *Agrion hastulatum*. In the usual way the male of this species is easily distinguished from *Enallagma cyathigerum*, which in general appearance it closely resembles, by the spots on the dorsal surface of the second segment (see Pl. II. figs. 3 and 5). The two lateral spots are, however, sometimes absent, as is the case in the Scotch example, and the remaining spot resembles the corresponding spot on some forms of *E. cyathigerum*. However, on consideration of other less conspicuous points of difference, the Scotch insect has been found to be a true *Agrion hastulatum*, and we hope soon to find the number of captures increased, when amongst them will no doubt be found examples of the typical form.

It should be stated that many new localities for the common species have been found during the year; but the list is too lengthy for insertion here.

NEUROPTERA, OTHER THAN ODONATA, IN 1900.

BY W. J. LUCAS, B.A., F.E.S.

So few localities for many of the Neuroptera have been recorded that perhaps a list of my captures in 1900, even of common species, may be of interest. They were not collected systematically.

PSOCIDÆ.—*Stenopsocus cruciatus*, New Forest, August 13th; *Elipsocus unipunctatus*, Esher Common, July 1st; *E. abieti*, New Forest, August 13th.

PERLIDÆ.—*Chloroperla grammatica*, New Forest, beginning of June; *Isopteryx torrentium*, New Forest, beginning of June; *Leuctra* (*nigra* probably), Esher Common, May 19th; *Nemoura inconspicua*, Esher Common, May 19th and September 10th; *N. variegata*, Esher Common, May 19th.

EPHEMERIDÆ.—*Ephemera vulgata*, Byfleet Canal, Surrey, July 8th; *Leptophlebia submarginata*, Esher Common, May 19th; New Forest, beginning of June; *Cloeon simile*, Ockham Common, June 23rd; *C. rufulum*, New Forest, July 28th.

PLANIPENNIA.—*Sialis lutaria*, Esher Common, May 19th and June 17th; New Forest, beginning of June; *Raphidia notata*, Esher Common, July 14th; *R. maculicollis*, Esher Common, May 19th and June 10th; *Osmylus maculatus*, New Forest, June 4th; *Hemerobius nitidulus*, Esher Common, April 24th, May 19th; *H. micans*, near Horsley, Surrey, May 30th; New Forest, August 13th; *H. stigma*, Esher Common, January 6th, February 25th, March 10th, April 24th, May 19th, June 17th, September 1st, December 16th; *H. concinnus*, very numerous, Ockham Common, Surrey, June 23rd; *Chrysopa flavifrons*, at sugar, New Forest, August 11th; *C. tenella* (probably), Esher Common, June 10th; *C. vulgaris*, New Forest, August 7th; near Studland, August 8th; *C. phyllochroma*, New Forest, July 31st; *C. perla*, Esher Common, June 10th and 17th; *Coniopteryx aleyrodiformis*, Esher Common, May 19th; *Panorpa communis*, New Forest, beginning of June; *P. germanica*, Bagley Wood, Berks, August 29th; near Claygate, Surrey, September 10th.

TRICHOPTERA.—*Phryganea varia*, Esher Common, June 30th; *Glyptotaelius pellucidus*, Esher Common, May 19th; near Chertsey, Surrey, July; *Limnophilus affinis*, near Studland, Dorset, August 8th; *L. centralis*, Esher Common, May 19th; near Esher, June 30th; *Micropterna sequax*, near Horsley, Surrey, July 7th; *Sericostoma personatum*, New Forest, beginning of June; *Goëra pilosa*, New Forest, beginning of June; *Leptocerus cinereus*, Weybridge, Surrey, June 24th, July 8th; *L. alboguttatus*, Kingston-on-Thames, June; *Holocentropus picicornis*, near Ockham, Surrey, June 23rd; *Cyrnus trimaculatus*, Weybridge, June 24th.

THE NAVAL MANŒUVRES OF 1900, FROM AN ENTOMOLOGIST'S POINT OF VIEW.

By T. B. FLETCHER, R.N., F.E.S.

THOUGH the connection between the naval manœuvres and a scientific magazine may at first sight appear rather distant, I have thought that a few entomological extracts from my log for the period may prove of interest.

We commissioned H.M.S. 'Edinburgh' at Chatham on July 10th, and left Sheerness on the 12th for Portland, which was the rendezvous of the "A" Fleet. It was much too busy a time just now to do any collecting, though visions of Portland's far-famed products in the way of *Acidalia degeneraria* and *Agrotis præcox*, with *Thymelicus actæon* quite in the neighbourhood, seemed to offer temptation enough. All the ships having joined the flag, we left again on July 16th for Berehaven, where, however, our stay proved to be only for five hours, as we were hurried on to Lough Swilly.

Here we had a day or two before hostilities commenced, so I managed to get ashore on July 21st. There were, however, not many butterflies about, though it was a bright afternoon and hot enough climbing the hills in the sun. *Epinephele ianira* was the commonest species on the wing; the markings on the under side of the hind wings seem more pronounced than usual. *Satyrus semele*, two only, apparently just emerging. *Lycæna icarus*, common in cornfields. *Pieris napi*, one only. *P. brassicæ*, common. When I left England in 1896 I had not seen one for two or three years. I think it was in 1894 that they seemed suddenly to disappear, but now they have apparently become as common as ever. *Camptogramma bilineata*, one, beaten. The absence of moths seems remarkable.

On July 26th we left Lough Swilly to make a long detour into the Atlantic and up the Channel to Queenstown, and by the time we got there hostilities had ceased. After another stay of a few days at Portland we returned to Sheerness to pay off, and now there was more leisure for collecting.

On August 11th I took the net out along the clay cliffs of Sheppey—well-known to fossil-hunters. In the Dockyard, on the way, I saw a few worn *Stilpnotia salicis* on the poplars, and a *Macroglossa stellatarum* buzzing around a coal-heap, an object which seems to exercise a great fascination for this species. Arrived at the cliffs, the lucerne fields were found to be the great attraction, being simply alive with insect life. *Colias edusa* was represented by a few specimens, but *C. hyale* was simply in scores. This latter is more easily captured than *edusa*, but must be caught at the first stroke of the net, for, once alarmed, pursuit through the heavy lucerne is almost useless. *Gonepteryx rhamni*,

one male, quite fresh. *Pieris brassicæ* and *P. rapæ*, abundant. *P. napi*, one female only. *Aglais* (*Vanessa*) *urticæ*, very common. *Vanessa polychloros*, *V. io*, and *Pyrameis atalanta*, single specimens of each. *P. cardui*, common. *Pararge megæra*, a few of the second brood; just emerging. *Epinephele ianira* and *E. tithonus*, abundant, but worn and tattered. *Lycæna astrarche*, one. *L. icarus*, several on grassy patches, but none on the lucerne. *Hesperia thaumas* (*linea*), a few, very worn, along the cliffs. I netted all I saw in hopes of *lineola*, which occurs here, but they were all *thaumas*. *Anthrocera filipendulæ*, one colony, about half-way down the cliffs. *Spilarctia menthastri*, one larva. *Bryophila perla*, one, on a gate-post in the town. *Eremobia ochroleuca*, two, both at rest on flower-heads. *Hadena trifolii*, one, flying round the lucerne in the sunshine. *Plusia gamma*, absolutely in thousands round the lucerne. *Strenia clathrata*, a few along the cliffs. *Eubolia limitata*, common amongst mallow. *E. bipunctaria*, one only.

On August 14th I went out along the cliffs again. It was beautifully bright and hot, but a strong easterly breeze, which got up in the afternoon, could well have been dispensed with from a collecting point of view. *Colias hyale* and *C. edusa* were again abundant in the lucerne fields, the latter being now more plentiful. Of *C. hyale* I took a very nice white female. *Pieris brassicæ* and *P. rapæ*, common; full-fed larvæ and pupæ of *P. rapæ*. *Aglais urticæ*, a few; several chrysalids near nettles. *Pyrameis cardui*, common. *P. atalanta*, several full-fed larvæ on nettle. The larva spins a leaf together lengthwise and pupates inside it. *E. ianira* and *tithonus*, common, but very worn. *L. icarus*, common; one "dwarf" specimen. *Chrysophanus phlæas*, one only. *M. stellatarum*, one, on lucerne. *Porthesia similis* (*auriflua*), several settled on leaves at the bottoms of hedges. *Plusia gamma*, abundant on the lucerne. *Strenia clathrata*, common. *Hepialus sylvanus*, one, on a post in the Dockyard.

On August 16th I landed again with the net. It was beautifully fine and bright, but there was a north-easterly breeze, which was much too strong for the butterflies, and few were about except in sheltered corners. *Colias hyale* and *edusa*, abundant in the lucerne fields. *Aglais urticæ*, only one butterfly, but quantities of larvæ of all ages. *Vanessa polychloros*, one at rest under a hedge. *Pararge megæra*, common along the sunny sides of hedges, out of the wind. *E. ianira* and *tithonus*, common along hedges, but very worn. *Cænonympha pamphilus*, common. *Chrysophanus phlæas*, one, very worn. *Cyaniris* (*Lycæna*) *argiolus*, one worn male along a hedge. *L. icarus*, common. *L. astrarche*, one. *Smerinthus ocellatus*, a fine larva on willow. *Plusia gamma*, not nearly as plentiful as previously. It seems as if they had dispersed or migrated. The difference in numbers was to-day

most striking. Two days ago there were thousands on the wing round the lucerne flowers; to-day a few solitary specimens were all that remained.

This concludes my collecting during the manœuvres. Except for the last week at Sheerness, which yielded twenty species of butterflies, there were few opportunities of collecting, if we omit *Tinea biseliella*, which was only too abundant on board! It is evident that 1900 will long be remembered as "the great *Colias* year," but I do not recollect having seen in the magazines any previous record of either species from Sheppey.

H.M.S. 'Gladiator,' Mediterranean Station.

ON THE FEMALE POUCH IN *ACRÆA*.

By GUY A. K. MARSHALL, F.Z.S., F.E.S.

In the November issue of the 'Entomologist' Dr. Chapman raises an interesting question as to the significance of the curious anal pouch which is found in the females of *Parnassius*. It may therefore be as well to record the fact that a similar structure occurs in the females of *Acræa*, these being, I believe, the only two genera of butterflies which exhibit this peculiarity, and it seems at least probable that it may serve the same purpose in both cases.

A year or two ago, when writing to me on this subject, Professor Poulton suggested that possibly the structure might be of use in guiding the egg during oviposition, or even that the egg might be carried in it until a suitable place for it had been found. Therefore, in order to obtain some evidence for the former proposition, I carefully watched several examples of *Acræa caldarena* and *A. nohara-halali* during the act of laying their eggs. As a result of this I found that the egg, on extrusion, did not in any way come into contact with the pouch, this latter being placed too much upon the ventral surface of the abdomen to render it of any use for the purpose of oviposition. Indeed, in some cases it appeared to be rather an obstruction than otherwise, for in the food-plant of these *Acrææ* the sides of the leaves sometimes fold together rather closely, and more than once I have seen a female trying to insert her abdomen in such a place, but prevented from doing so by the projecting pouch.

Again, both the position and construction of the pouch render it highly improbable that it can be used for the purpose of transporting the eggs, and although I have caught some hundreds of the insects at various times, I have never yet found this to be the case.

Further, so far as the genus *Acræa* is concerned, the structure cannot be used for jerking the eggs away, as suggested by Dr. Chapman for *Parnassius*, for, as stated above, the eggs do not touch it; and, besides, in the six species of *Acræa* which I have seen laying their eggs, these were always deposited on the plant, and not jerked away.

I am thus inclined to believe that in *Acræa* the sac has no connection with oviposition, but that its use consists in protecting the gravid females from the advances of unattached males. But the question then arises, why the female *Acræa* should require this special protection. In reply thereto I may say that, so far as my observation goes, in all our South African butterflies, "marriage by courtship" is the rule, with the exception of the *Acræas*, among which "marriage by capture" is certainly a frequent, and probably the general, method; at least, I have observed its occurrence in no less than eight different species of the genus. The male *Acræa* does not indulge in the graceful fluttering and "showing-off" which is so characteristic of the courtship of most butterflies, but his chief idea seems to be to seize the female with his legs. In the case of the sylvan *A. petræa* and *A. horta* I have frequently seen a male capture a female in mid-air by grappling the costa of her fore wing, thus bearing her to the ground, when, after a few seconds, they would fly away paired. In the open veldt species, as *doubledayi*, *nohara*, *violarum*, &c., the female is more often pounced upon while settled on the ground.

The importance of some protection for the female while laying her eggs under these circumstances is sufficiently evident, and the development of the pouch has therefore been probably fostered by natural selection. However, there is evidence to show that the protection afforded by the secretion of this process is not absolute, for I have taken three females in which the sac has been duplicated, which I can only attribute to the result of a second pairing. In every case both sacs were more or less distorted or abnormal in shape, and it is therefore probable that the second pairing must have taken place almost immediately after the first, that is, whilst the first pouch was still soft or pliable. If this be so, these exceptions need not invalidate the supposition that the pouch, when hardened, would offer a sufficient obstruction to the use of the complicated male claspers. It may be mentioned, that after a certain time the sac is more easily detached from the ventral plate, and it is thus frequently wanting in old and battered specimens.

In those butterflies in which courtship precedes pairing the male soon ceases his attentions after persistent refusal; but among many of the Pieridæ a characteristic attitude is adopted by the female for this purpose. The wings are laid flat on the ground, but directed so much backwards that the fore wing

almost entirely conceals the hind wing, and the abdomen is raised high in the air. As pairing generally takes place from the side in these butterflies, such a position effectually prevents it; and from the numerous cases which have come under my notice, I can have but little doubt that the significance of the attitude is appreciated by the male.

It will be of much interest to learn whether there is any reason to believe that the mating habits of *Parnassius* are similar to those of *Acræa*; for, if it be so, it will lend considerable support to the explanation of the pouch proposed above.

Salisbury, Mashonaland : December, 1900.

SYNOPSIS OF EXPERIMENTS IN HYBRIDIZATION AND TEMPERATURE MADE WITH LEPIDOPTERA UP TO THE END OF 1898.

BY PROF. DR. MAX STANDFUSS.

(Concluded from p. 13.)

THESE peculiar phenomena will be more easily understood by two observations made by Darwin, who gathered a lot of interesting material about these matters in his wonderful works.

Firstly, he cites a number of facts, which apparently prove the presence of characters which are present in a latent form in the living creature, and, under normal conditions, remain latent. He states, that there exist in all females secondary male characters in a latent form, and, *vice versâ*, which are in a state of quiescence, but are ready, under certain conditions, to develope.

Secondly, Darwin proves the existence of a correlative change, in fact, the correlation of parts of the living organism. A special case of correlation of characters is that between primary and secondary sexual characters. Stags, whose testicles have been injured either by a shot or in any other manner, grow monstrous horns. If one testicle is entirely lost, the horn on that side of the body ceases entirely to develope.

It is, further, by no means rare for female individuals, whose genital apparatus has been injured, removed by an operation, or become atrophied by age, to acquire secondary male sexual characters; as, on the other hand, the male may acquire secondary female sexual characters. These facts are to be traced to the presence, in a latent form, of the characters of the other sex.

In our special case of gynandromorphic structures among secondary hybrids, the malformation and degeneration of the egg-

germs of these forms are to be traced,¹¹ chiefly, to the evil influence on the sexual products exercised by the primary hybrid parents; and, secondly, in a lesser degree, to their own hybrid origin.

The appearance of a male-female form—that is, in outward appearance—is, therefore, directly connected with this degeneration and malformation of the egg-germs. It would be of great interest to ascertain the condition of the genital products of female hybrids capable of reproduction. The hybridization experiments, recently tried with other Bombycid species, whose female hybrids produce numerous and, to outward appearance, normal eggs, can be used for such a study.

It may here be observed, that the close correlation, which undoubtedly exists between the structures situated in the centre of an organism, the germ products, and the secondary sexual characters situated on the outer periphery of the body—centrifugal relationships, as we may call them—make probable the existence, on the other hand, of close correlation in a reversed or centripetal direction; that is to say, changes which appear in the periphery, also those which owe their appearance to factors of the outer world, cause changes in the central organs, that is, the egg-germs and their products. An influence in a centripetal direction actually occurred in the frost experiments with regard to the altered markings of *Vanessa urticae*, as the latter were actually transmitted to the offspring. The warmth experiments with the pupæ of *Rhodocera rhamni* exhibit a singular example of the resulting centrifugal influence.

A number of females obtained by this experiment had almost entirely taken over the male coloration. Those female individuals which were experimented with, while throwing off the larval skin or as fresh pupæ, were especially influenced in the direction of male coloration. But these latter also showed a distinct crippling of the egg-germs, which could generally be observed from the outside, by a noticeable shrinkage of the whole abdomen of freshly-emerged specimens. As a result of the latest experiments may be mentioned, that the females of *Saturnia cæcigena*, Cup., obtained feathered antennæ, which otherwise are confined to the male.

These females were obtained from pupæ, which were experimentally compelled to hibernate, and these insects also showed a decided and anatomically easily proved crippling of the egg-masses. The experimental influence on the egg-germs is in both cases bilaterally symmetrical, and following the correlative alteration in the periphery of the body in an entirely systematic manner, even when the change is only partial. These are, then,

¹¹ Compare O. Hertwig ('Zeit und Streitfragen der Biologie.' Jena: G. Fischer, 1894, pp. 120, 121).

phenomena closely related to gynandromorphism. On the other hand, it is obvious that the individuals are not hermaphrodites. The females remain females, only their fertility has suffered by the experiment, or has been destroyed by the same.

At this opportunity it would be well to mention, that female germs seem to be much more sensible to influences than the male.

Firstly, all were females in the above-mentioned temperature experiments, at least as far as our present experience goes.

Secondly, the gynandromorphic individuals of the secondary hybrids are predominantly female in their character.

Thirdly, the fact that the female hybrids, with rare exceptions, are not capable of reproduction, whereas the male hybrids are always fertile.

Fourthly, must here be mentioned the inclination of female individuals to sterility when badly fed, if this want of food is caused by man (I have mentioned such instances in my book 'Paläarktische Gross-Schmetterlinge,' pp. 194, 195), or from the habits of certain social insects—for instance, Hymenoptera (ants and bees) and Termites. Prof. Emery (Bologna) has published many facts about this alimentary castration, as he calls it, of ants ('Compte-rendu des séances du troisième congrès international de Zoologie,' Sept. 16th to 21st, 1895: Leyde, pp. 395-410).

But now to return to the continuation of the hybridization experiments in 1897. Among the primary hybrids obtained in the first crossings between the *Saturnias spini*, *pyri*, and *pavonia*, neither in my own experiments nor in those made by others was a single primary hybrid obtained which was capable of reproduction, even in the slightest degree, when crossed with one another, only one secondary hybrid, No. 18, was fertile to a slight degree.

Moreover, no other primary hybrid bred by me had the necessary qualifications, with the exception of the crossing between *Zygæna trifolii* ♂ and *Z. filipendulæ* ♀; and that crossing was, at that period, unfortunately not investigated with regard to this question; nor has such a capability of reproduction been noticed in any of the other Lepidopterous hybrids which have been reared up to the present.

It was not to be expected, according to present experience, that this blank in the experiments could be filled by related species which exhibited marked differences in physiognomical aspect; and, on the other hand, nearly related types, with habitats either entirely or nearly entirely separated, could not be used for the experiment. In the latter case, there was always the possibility that these were only local races of the same species. It is well known that local races of the same species often exhibit highly important physiognomical differences.

Moreover, forms had to be selected which, although nearly related, were, however, undoubtedly specifically distinct, but with common habitat.

The *Drepana* species, *falcataria*, L., and *curvatula*, Bkh., and the various species of the genus *Pygæra*—*pigra*, Hfn., *curtula*, L., and *anachoreta*, F.—fulfilled these conditions.

Fertile crosses between *Drepana curvatula* ♂ and *falcataria* ♀, and between *Pygæra curtula* ♂ and *pigra* ♀, and *curtula* ♂ and *anachoreta* ♀, were obtained. All these crossings were successfully reared to the imago.

The hybrid of the two hook tips (Pl. IV. figs. 5 and 6), which, in honour of my colleague, Dr. H. Rebel, of the Vienna Natural History Museum, I have named *Drep. hybr. rebeli*, mihi, paired very easily, and the females laid a varying number of eggs, which, to outward appearance, were normal.

As a matter of fact, embryos developed in a number of these eggs, but finally none of the larvæ escaped from the shells; they all died in the egg. Three eggs which were opened contained normally developed, though dead, caterpillars.¹²

The hybrid brood of *Pygæra curtula* ♂ and *pigra* ♀ produced normal male and female (Pl. IV. figs. 11 and 12). A pairing of this form, owing to the short life of the imago, would hardly have been possible, as, curiously enough, the male imagines developed much faster than the female, which is not the case to such a degree in pure species of this genus. Therefore a number of large, apparently strong males were placed in the cellar, and again brought into ordinary temperature, when the females belonging to this form commenced to emerge. In this manner five pairings of this hybrid were obtained, and the five females laid eggs in the following numbers: 85, 103, 112, 121, 154. In a fair number of these eggs larvæ developed, but the majority of these did not emerge. As a matter of fact, from the 103 developed 5; the 121, 12; and the 154, 17 larvæ.¹³ All these took readily to their food, and seemed to promise a successful development. This could, however, only be followed for a short time, as on August 22nd, 1897, I was suddenly called to North Germany on pressing duties. The larvæ had to be sleeved out on a willow tree, and there all died.

The rearing of the last hybrid to be mentioned—*P. curtula* ♂ and *P. anachoreta* ♀—produced a curious result. The greater number of the larvæ rapidly obtained their growth, and about

¹² In 1898 a small number of these caterpillars emerged from the egg, but breeding them was not successful, although the little larvæ were full of life. They took very little or no food, and all died within forty-eight hours after leaving the egg.

¹³ In 1898 I also obtained offspring from this hybrid, and again from numerous pairs, but the larvæ soon died, in spite of good weather and food; they apparently were wanting in energy.

the middle of June pupated, and during the same month produced imagines, which were one and all males (Pl. IV. fig. 14). These crossed back with *anachoreta* ♀ produced, at the beginning of August, a further imaginal generation, but again only males; all the female pupæ of this secondary hybrid hybernated. The secondary hybrid males and, as has been since found, also the females are much nearer to *P. anachoreta*, but, by exact comparison, differ in a regular manner from the last-named species, especially in the reduction of the group of dark spots at the dorsal angle of the upper side of the fore wings. The above-mentioned secondary hybrid males were again paired with *anachoreta* ♀, and produced offspring, which, however, on account of press of other work, were sleeved out, and not noted further.¹⁴

The minority of the primary hybrid larvæ of the crossing—*P. curtula* ♂ × *P. anachoreta* ♀—developed very slowly, and in a somewhat different physiognomical form to the first series; whereas the former was an intermediate form, which stood nearest to the phylogenetically oldest form, *curtula*, but which, however, had distinct traces of its *anachoreta* origin; the slow developing larvæ obtained more and more the characters of pure *curtula* larvæ. On Aug. 15th, 1897, when the offspring of nephews—obtained from the other portion of the brood, which, however, were treated in exactly the same manner—were in the larval stage, not a single one of this second series had pupated, and only two individuals were nearly full grown, which were much larger than a big, full-grown *anachoreta* larva. One of these two individuals pupated on the 21st, and the other on the 23rd of August; both were females.¹⁵ All the remaining specimens of this series would no doubt have been females, but they all died during my absence from Zurich. During this time the imagines had also emerged from the two pupæ obtained; I found them at the beginning of October still alive, but knocked to pieces; they were, as far as could be seen from their condition, mostly related in form to the phylogenetic oldest of the parent species. Both

¹⁴ In the autumn of 1898 a small number of imagines of this pairing, No. 30 (see Table, No. 15), were reared. They resulted entirely in male specimens, which differed very little from *P. anachoreta*. These males were, without doubt, capable of reproduction, although in a lesser degree.

¹⁵ Of two further female pupæ of this interesting hybrid from 1898—which I have named *P. hybr. ræschkei*, after my assistant, E. F. Ræschke, who has rendered me great assistance in my experimental entomological work during the last few years—one imago emerged in October, and the other died during the winter. The imago bred in October, 1898, is illustrated (Pl. IV. fig. 13). It shows the immense size of this female hybrid. This female is, however, not so closely allied to the type of *curtula* as the two individuals bred in 1897, which unfortunately escaped. The capabilities of development of the eggs of this female could not be ascertained this time, as not a single *Pygæra* male, either of hybrid or pure origin, was present at that time.

females had distributed in the breeding-cage masses of eggs, which seemed to be normally constructed, and whose capabilities of development should be proved. How are these curious results to be explained?

The fact, that in our experiments the male *Pygæra* hybrids develop much quicker than their sister females, and that the male hybrid immediately produces a big third generation of males, indicates a progressive developmental tendency, which is further confirmed by other facts. But above the tendency to progressive development in a biological and morphological direction, is the law again to the fore among these *Pygæras*, that the characters of the oldest phylogenetic species are impressed upon the offspring; we will, however, not reiterate this question.

On the other hand, with regard to the females of the *Pygæra* hybrids, they later endeavour to return to the original simple one generation during the year (for this was certainly the primitive condition). This state comes about sometimes directly; and, moreover, the females of this hybrid form, both as larvæ and imagines, revert to a greater degree than the males to the oldest phylogenetic form.

It is quite a common character of the Lepidoptera (of which I have mentioned several important facts in my Handbook) that the male individuals have a well-marked tendency to progression, and to the creation of new forms; whereas the females are more conservative, and, in some cases, show a tendency to retrogress. If we now regard the hybrids, who, in comparison with individuals of pure origin, must be conceded to have a greater freedom and individuality in their evolution, their development is not influenced by the junction of two germs which are pushing forward in the same direction, but by the junction of influences pushing in two opposite directions: in the male sex a tendency to development in a definite and progressive direction; in the female, an opposing tendency to retrogress. The tendencies directing development, which are here forced upon our notice, are no doubt inherent sexual peculiarities, or, as we may well say, sexual characters which have become constitutional. Unfortunately we can only give a passing notice to this extraordinary fact.

From these new hybridization experiments we have, firstly, filled the gap in our former hybridization experiments.¹⁶ There have now actually been found, from three different crossings, primary hybrid females which are apparently normally formed,

¹⁶ As will be seen in footnotes 11 to 14, the crossing experiments with *Drepana falcataria* and *curvatula*, and with *Pygæra pigra*, Hfn., *curtula*, L., and *anachoreta*, F., were repeated in 1898. Not only these, but a number of new experiments were added to those already made with the Bombycid species.

and have scarcely a less number of eggs in their ovaries than is averaged by the pure species. The in-breeding of two of these hybrids resulted in eggs from which emerged a number of larvæ (see footnotes 11 and 12), which, however, up to the present, have not been successfully reared.

Secondly, they have confirmed that the physiognomical aspect of the hybrid will be mainly influenced by the phylogenetic oldest species.

Thirdly, subordinate to this law, certain characters found more or less pronounced expression (especially with hybrids of the genus *Pygæra*), which may be regarded constitutional to the sexes of Lepidoptera, viz.: in the male, a tendency to progressive development; in the female, conservative tendencies and inclination to retrogress.

To gain a quick and systematic view of the matter, the following twelve hybrid broods were obtained:—

| | | |
|---|---|--|
| 20. Drepana $\frac{\text{curvatula Bkh. } \delta}{\text{falcataria L. } \text{♀}}$ | 21. Drep. $\frac{\text{falcataria } \delta}{\text{curvatula } \text{♀}}$ | 22. Drep. $\frac{\left(\frac{\text{curvatula } \delta}{\text{falcataria } \text{♀}} \right) \delta}{\left(\frac{\text{curvatula } \delta}{\text{falcataria } \text{♀}} \right) \text{♀}}$ |
| 23. Pygaera $\frac{\text{pigra Hfn. } \delta}{\text{ourtula L. } \text{♀}}$ | 24. Pyg. $\frac{\text{ourtula } \delta}{\text{pigra } \text{♀}}$ | 25. Pyg. $\frac{\text{ourtula L. } \delta}{\text{anachoreta F. } \text{♀}}$ |
| | | 26. Pyg. $\frac{\text{anachoreta } \delta}{\text{ourtula } \text{♀}}$ |
| 27. Pyg. $\frac{\left(\frac{\text{pigra } \delta}{\text{ourtula } \text{♀}} \right) \delta}{\left(\frac{\text{pigra } \delta}{\text{ourtula } \text{♀}} \right) \text{♀}}$ | 28. Pyg. $\frac{\left(\frac{\text{ourtula } \delta}{\text{pigra } \text{♀}} \right) \delta}{\left(\frac{\text{ourtula } \delta}{\text{pigra } \text{♀}} \right) \text{♀}}$ | 29. Pyg. $\frac{\left(\frac{\text{ourtula } \delta}{\text{anachoreta } \text{♀}} \right) \delta}{\text{anachoreta } \text{♀}}$ |
| 30. Pyg. $\frac{\left(\left(\frac{\text{ourtula } \delta}{\text{anachoreta } \text{♀}} \right) \delta \right) \delta}{\text{anachoreta } \text{♀}}$ | 31. Pyg. $\frac{\left(\frac{\text{anachoreta } \delta}{\text{ourtula } \text{♀}} \right) \delta}{\text{ourtula } \text{♀}}$ | |

From a number of pairings of Nos. 22, 27, and 28, a small number of larvæ were obtained, but they were never successfully reared. The whole of these creatures showed evident signs of want of energy. The remaining nine crossings were all reared to the imago, some of them in numbers.

The hybrid of *Drepana curvatula* ♂ × *falcataria* ♀ (No. 20) is, as already stated, figured (Pl. IV. figs. 5 and 6), being a male and female; Pl. IV. figs. 8 and 9, show a pair of the reciprocal hybrid No. 21. Of No. 20 the males and females emerged together, whereas in No. 21 the male imagines soon emerged, but none of the females developed at once, but hybernated as pupæ. This biological difference was already very apparent during pupation. The male individuals only bent round a small portion of the edge of the leaf, fixed to the same in its concave shape by a few small threads on the surface, and changed to a

pupa in this more or less open pocket. The females, on the other hand, rolled a large portion of the leaf sharply around, beginning at the edge, and closed over the so-formed pocket with numerous strong silk threads, with the exception of a small opening to allow the larva egress, and then gnawed this cocoon loose from the rest of the leaf, so that it fell to the ground, or rather into the sleeve, and then fastened up the opening. In this manner the pupa was better protected against many dangers than if it fell, in late autumn, with the rest of the leaves. These females also had regularly a number of eggs in their ovaries, the developing powers of which have, however, not as yet been ascertained.

Both hybrids Nos. 20 and 27 are nearer to *Drepana curvatula* than *falcataria*, but it cannot be determined, with accuracy, as to whether the male has a stronger influence on the aspect of the hybrid than the female, on account of the limited number of imagines of cross No. 21 as yet obtained.

Pl. IV. figs. 9 and 10 shows a female and a male of the crossing between *Pygæra pigra* ♂ × *curtula* ♀ No. 23; and, as we have already seen, Pl. IV. figs. 11 and 12, a female and male of the reciprocal cross No. 24. As in the latter, so in the former, the males emerged previous to the females, but not with such a great interval of time as in No. 24. It was, therefore, possible to obtain numerous in-breedings of No. 23 without resorting to artificial means to keep back the males. It was not, however, found possible to rear the numerous offspring of this hybrid, as the larvæ died soon after leaving the egg. Both crossings Nos. 23 and 24 are nearer to *pigra* than *curtula*; but the females have a prevailing influence on the aspect of the hybrids, if either sex predominates.

Pl. IV. figs. 15 and 16 shows a pair of hybrids of *P. anachoreta* ♂ × *curtula* ♀ No. 26. The reciprocal hybrid No. 25, which is figured Pl. IV. figs. 13 and 14, has already been dealt with in the text and in footnote 14. Both forms are nearer the phylogenetically older form *curtula* than the younger *anachoreta*; but, in a subordinate manner, the influence of the male prevails in the aspect of these reciprocal hybrids.

The hybrid No. 26 is very difficult to obtain, and, according to the present experiments, only gives a small percentage of living progeny. In 1898, out of six pairings, each of which contained from 150 to 200 eggs, only seventy larvæ were obtained, and from which only twenty-seven imagines were bred. Two of these insects were females, both of small size, whose ovaries could only hold a few eggs. One of these females is figured, Pl. IV. fig. 15.

Further, appeared among these hybrids an individual with wonderfully irregular colour tones, light and dark, grey and brown being mixed up together in the colouring of the upper side of the right and the under side of the left fore wings. Perhaps this is a gynandromorphic form, as the (unfigured) female actually has a darker coloration than any of the males. The antennæ of this specimen are true male, but it possesses a monstrous abdomen, of which more later.

Further, among the twenty-seven hybrids were three specimens, which, although to all appearances male, did not have the abdomen composed of the usual nine segments; the specimen just mentioned above also comes under this head. Two of these specimens had the seventh abdominal segment developed to its proper extent on the left side only, and the remaining two had this same seventh segment properly developed only on the right side, decreasing in size, in all four cases, to the middle of the back, and beneath to the middle of the belly, and disappearing towards the opposite side of the

body. This monstrous growth was noticeable when the larvæ emerged from the egg, and remained throughout all their stages to the same degree and extent.

The twenty-one remaining individuals were ordinary males (Pl. IV. fig. 16). One of them paired with a female of *P. curtula*. From this brood male imagines were quickly obtained, which were very close to *P. curtula*, cross No. 31.

These males were not used for further experiments. The female individuals of this secondary hybrid did not emerge at once, but remained in pupæ over the winter, and emerged in the spring of 1899. They are also very like *P. curtula*, and are sexually well developed; when paired with *P. curtula* ♂ large broods were obtained. These experiments are at present still being pursued, so I must save information as to their results for a later publication.

CONCLUSION.

The results of our Hybridization Experiments can only support the original idea as to the formation of species, expressed as an introduction to these experiments.

We found by this examination of the physiological divergences and differences of related types that the various pairs of species are related to each other in very varying degrees. But this observation was to be expected on the assumption of a gradual separation and evolution of related forms going on alike in the past, present, and future.

Beginning with pairs of species, with which one was able to effect crossings, without, however, their being capable of producing offspring, and with such degrees of relationship that hybrid offspring could be obtained, but apparently without life energy (crosses Nos. 4 and 7), there were further evinced many steps to a higher and higher physiological affinity between the various pairs of species experimented with, until at last, although not to a very high degree, hybrids were found (crosses Nos. 22, 27, and 28) which were actually capable of reproduction, although their offspring were not successfully reared. In another case, by crossing back the primary hybrid male with one of the parents (pp. 17 and 18, crossing No. 13), the physiological affinity was so far restored that a hybrid was produced which was capable of reproduction in a slight degree, and from which two male offspring were actually bred to the imago (cross No. 18, also p. 18, footnote 5).

A lengthy period of existence, phylogenetically speaking, of the divergence between nearly related types, according to our experiments, is in no way connected with the higher degree of difference on the lines of biological, physiognomical, and physiological characters than between pairs of species which have been divergent for a lesser period, even when nearly related groups of species are in question. The long separated *S. pavonia* and *spini* are, in most of their characters, less separated from each other than the later formed *S. pyri* from either of them.

Ordinary selection between differently formed individuals, in the sense of Weismann's pre-formation, cannot, we think, account

for these appearances. We should be far more inclined to say that the divergence was, in the first instance, the direct result of certain modifying factors of nature, one of which would be temperature, whose undeniable effects in changing the aspect of species we have already seen in the temperature experiments. It is easily understood that a factor causing slight divergence during a long period would have less result than a factor causing strong divergence in a shorter. Perhaps the capability of reaction or change is increased when certain individuals, through the influence of natural factors, have been driven from a condition of relative stability to one of unstable equilibrium. The probability of this theory is confirmed by certain groups of the Lepidoptera, in their, one might say, explosive change of form, for example, in the tribes of *Zygæna* and *Agrotis*. Among plants, the families *Hieracium*, *Rubus*, and *Rosa* seem to be similarly situated.

[The four plates accompanying Mr. Dadd's translation of Prof. Standfuss's paper are reduced copies of the originals in 'Insekten Börse,' 1899, published by Frankenstein & Wagner, of Leipzig.]

NAMES OF LEGS OF INSECTS.

By G. H. VERRALL, F.E.S.

WHEN will entomologists of the present time correctly name the legs of insects?

All entomologists know that insects have three pairs of legs, but after that (in at least Dipterology) they seem to be in hopeless confusion.

The three pairs of legs are—

1. Front legs=*Pedes antici*.
2. Middle legs=*Pedes medii*.
3. Hind legs=*Pedes postici*.

For convenience there exist the combinations of—

1. } Anterior legs=*Pedes anteriores* (excluding "*postici*").
2. }
2. } Posterior legs=*Pedes posteriores* (excluding "*antici*").
3. }

Let it be clearly understood that there is only

ONE pair of front, middle, or hind legs;

but that there are

Two pairs of anterior or posterior legs.

The above definition, of course, applies to parts, such as femora, tibiæ, tarsi, &c.

Anterior does NOT mean front only.

Posterior does NOT mean hind only.

N.B.—American journals please copy.

CATALOGUE OF THE LEPIDOPTERA OF IRELAND: SUPPLEMENTARY LIST.

By W. F. DE VISMES KANE, M.A., M.R.I.A., F.E.S.

(Concluded from p. 16.)

BUPALUS PINIARIA, *L.*—Near Kildare (*Freke*).

STERRHA SACRARIA, *L.*—One taken at Timoleague, Co. Cork, 27th August, 1898, by Mr. R. Donovan.

ABRAXAS SYLVATA, *Scop.*—Kenmare (*R. E. D.*).

HYBERNIA RUPICAPRARIA, *Hb.*—Sligo (*McC.*).

H. AURANTIARIA, *Esp.*—Enniskillen (*P.*).

CHEIMATOBIIA BOREATA, *Hb.*—Achill Island, Connemara (*R. E. D.*).

OPORABIA DILUTATA, *Bkh.*, and O. AUTUMNATA, *Bkh.*—The notice of *O. autumnata* and the two allied species by Mr. Prout in the March number of the 'Entomologist' for this year has again called my attention to the question of the distinction of these three alleged species. I have already noted the occurrence of a form from the Belfast hills, recognised by Mr. Barrett as probably *O. autumnata*, Gn. From a careful survey of a long series of *Oporabias* in my own collection, I cannot detect any which conform to Mr. Prout's diagnosis of the latter species. For the most part, however, they are woodland examples; and, though very varied, belong to the varietal forms of *O. dilutata*. *Ab. christyi* is one of the most numerous from Hazlewood, Sligo, and Mucross, Killarney, *cf.* Ent. xxxiii. pl. ii. figs. 7, 8, 9, 10; while fig. 14 is also represented from three or four localities. There are, moreover, some very beautiful forms with very white ground barred with four sharply defined fuscous bands. I trust that Irish lepidopterists, with Mr. Prout's paper to assist them in diagnosis, may for the future pay more attention to this interesting group.

LARENTIA FLAVICINCTATA, *Hb.*—At Murlough Bay, Ballycastle, Co. Antrim, the long grassy slopes which stretch up from the sea to the foot of the chalk cliffs are full of *Saxifraga hypnoides*, the food-plant of this species. It was here resting on the rock face that in 1897 that I met with numerous worn and a few fresh examples of this moth, a new addition to the Irish fauna. Probably it will be found all round the Antrim coast-line, and elsewhere, as in Sligo and the Burren of Clare, where this saxifrage is plentiful.

L. SALICATA, *Hb.*—Dromoland, Co. Clare (*Hon. E. O'B.*).

EMMELESIA TÆNIATA, *St.*—Timoleague, Co. Cork (*R. D.*).

EUPITHECIA PULCHELLATA, *St.*—Timoleague, Co. Cork (*R. D.*).

- E. SUBFULVATA*, *Haw.*—Timoleague, Co. Cork (*R. D.*).
E. SCABIOSATA, *Bork.*—Timoleague, Co. Cork (*R. D.*).
E. PLUMBEOLATA, *Haw.*—Timoleague, Co. Cork (*R. D.*); Dromoland, Co. Clare. Three at Clonbrock (*R. E. D.*).
E. ISOGRAMMATA, *H.-S.*—Clonbrock (*R. E. D.*).
E. PYGMÆATA, *Hb.*—Ardtully, near Kenmare, one; Timoleague, Co. Cork (*R. D.*).
E. JASIONEATA, *Crewe.*—One at Timoleague, Co. Cork (*R. D.*).
E. VIRGAUREATA, *Dbl.*—Plentiful at Timoleague, where Mr. Donovan reports two annual emergences, and has taken the larvæ both on *Solidago virgaureæ* and ragwort.
E. VALERIANATA, *Hb.*—Dromoland, Co. Clare, not rare (*Hon. E. O'Brien*); Timoleague, Co. Cork (*R. D.*).
E. INDIGATA, *Hb.*—Mr. Allen writes that he was not the captor of this species near Galway. The locality was Merlin Park, where the food-plant grows in great abundance.
E. CONSTRICTATA, *Gn.*—Near Clonakilty, Co. Cork (*R. D.*).
E. LARICIATA, *Frr.*—Sligo (*McC.*).
E. DODONEATA, *Gn.*—Sligo (*McC.*). Mr. Allen writes that the Galway record attributed to him is an error.
E. TOGATA, *Hb.*—Dalyston, near Loughrea, Co. Galway, abundant; Enniskillen (*P.*); Dunmanway, Co. Cork (*R. D.*).
EUPITHECIA DEBILIATA, *Hb.*—Abundant at Timoleague, Co. Cork. Mr. Donovan has taken one unicolorous specimen also.
LOBOPHORA SEXALISATA, *Hb.*—Timoleague, Co. Cork (*R. D.*).
L. HALTERATA, *Hb.*—Pontoon, Foxford, Co. Mayo.
L. VIRETATA, *Hb.*—Dromoland, Co. Clare (*Hon. E. O'Brien*).
MELANIPPE TRISTATA.—The Burren of Clare, local; Dalyston, near Loughrea.
PHIBALAPTERYX VITTATA, *Bork.*—Killarney (*R. E. D.*); Timoleague, Co. Cork (*R. D.*); Dromoland, Co. Clare, abundant.
TANAGRA ATRATA, *L.*—Near Belleek, Co. Fermanagh (*J.*).

PYRALIDES.

- SCOPARIA BASISTRIGALIS*, *Knaggs.*—Timoleague, Co. Cork (*R. D.*).
S. MERCURELLA, *L.*—Timoleague, Co. Cork (*R. D.*).
S. RESINEA, *Haw.*—Timoleague, Co. Cork (*R. D.*).
S. ANGUSTEA, *St.*—Timoleague, Co. Cork (*R. D.*).
OROBENA STRAMINALIS, *Hb.*—Timoleague, Co. Cork (*R. D.*).

PTEROPHORI.

- PLATYPTILIA BERTRAMI*, *Rössl.*—Bundoran (*J.*); Clonbrock (*R. E. D.*); Timoleague, Co. Cork (*R. D.*).

P. ISODACTYLUS, *Zell.*—Knockagh, near Carrickfergus (*W.*).

P. GONODACTYLA, *Schiff.*—Kenmare (*R. E. D.*).

P. TESSERADACTYLA, *L.*—Since writing my notice of this species, new to the British Islands, my expectation of discovering new haunts has been fulfilled. Many fresh areas about Ardrahan, Co. Galway, and thence through the Burren of Clare to Corcumroe and Ballyvaughan, have furnished specimens; so that there is no doubt that the species is spread over a very large area in Clare and Galway.

AMBLYPITILIA ACANTHODACTYLA, *Hb.*—Woodenbridge, Co. Wicklow (*G. V. H.*); Timoleague, Co. Cork (*R. D.*).

OXYPTILUS PARVIDACTYLUS, *Haw.*—Clonbrock (*R. E. D.*).

LEIOPTILUS LIENIGIANUS, *Zell.*—Kenmare (*R. E. D.*); Sligo (*R.*).

L. TEPHRADACTYLUS, *Hb.*—Dromoland, Co. Clare; Clonbrock (*R. E. D.*).

L. MICRODACTYLUS, *Hb.*—Clonbrock (*R. E. D.*); Sligo (*R.*).

ACYPTILIA GALACTODACTYLA, *Hb.*—Two at Kenmare (*R. E. D.*).

A. BALIODACTYLA, *Zell.*—Sligo (*R.*).

A. TETRADACTYLA, *L.*—Kenmare (*R. E. D.*); Ballyvaughan, Co. Clare.

A. PENTADACTYLA, *L.*—Dromoland, Co. Clare, a few. (*Hon. E. O'Brien.*)

CRAMBI.

SCHÆNOBIUS FORFICELLUS, *Thnb.*—Sligo (*R.*); Timoleague, Co. Cork (*R. D.*).

PHYCIDÆ.

HOMÆOSOMA BINÆVELLA, *Hb.*—Timoleague, Co. Cork (*R. D.*).

NEPHOPTERYX SPLENDIDELLA, *H.-S.*—Timoleague, bred by Mr. R. Donovan from larvæ feeding in spruce fir-cones.

RHODOPHÆA CONSOCIELLA, *Hb.*—Timoleague, Co. Cork (*R. D.*).

ZELLERIA PHILLYRELLA, *Mill.*—Since recording the capture of one specimen of this moth by the Rev. Canon Cruttwell, at Renvyle, Connemara, "among heather on the mountain side, though very near the plantation" (*in litt.*), I visited the locality. Unfortunately a tempest of wind and rain made collecting impossible. But I carefully examined the garden and plantations, and can confidently state that no species of *Phillyrea* grows there; nor is there, for many miles round, any shrubbery in which the plant could be looked for. In my correspondence on the subject with Mr. C. G. Barrett he wrote as follows:—"It is not always the habit of a *Zelleria* to keep close to its food-plant. It likes to hide in any dense cover. The nearest ally of *Zelleria phillyrella* is *Z. hepariella*. This species has long been known to frequent yew (*Taxus baccata*), and to be obtained by beating that tree. Its larva was there confidently looked for upon it, and it

came quite as a surprise when the insect was discovered to be an ash feeder! This makes it very probable that *Z. phillyrella* had only hidden itself among heather, and had fed on something quite different." From indications obligingly given me by Canon Cruttwell, I think that the spot in which he captured it will be found by turning to the right out of the Renvyle gate, and following the road bordered by the plantation to nearly the end of the trees. Here there are ash growing; and as *Phillyrea* belongs to the natural order of Oleaceæ (olive worts), as also ash, privet, and lilac, it seems likely that further research will establish Mr. Barrett's suggestion as correct, and that the phenomenal occurrence of this rarity in the extreme wilds of Connemara will be satisfactorily explained. I have to thank Canon Cruttwell and Mr. Barrett for their very obliging letters and information.

ADDENDA.

The following information has just come to hand from J. E. R. Allen, Esq., of Portora, Enniskillen:—

LITHOSIA DEPLANA, Esp.—One taken at Killarney, identified by Mr. Prout.

TRIPHÆNA ORBONA, Hufn. (*subsequa*, Hb.)—One at Lisbellaw, which I have examined.

TETHEA SUBTUSA, Fb.—Recorded already from near Enniskillen. Mr. Allen informs me that it is frequent in the various islands of lower Lake Erne.

EUCLIDIA GLYPHICA, L.—Common about Enniskillen.

EURYMENE DOLOBRARIA, L.—One at Enniskillen.

DESCRIPTIONS OF TWO NEW SPECIES OF PHYLLOMORPHINÆ (HETEROPTERA: FAM. COREIDÆ).

By W. L. DISTANT.

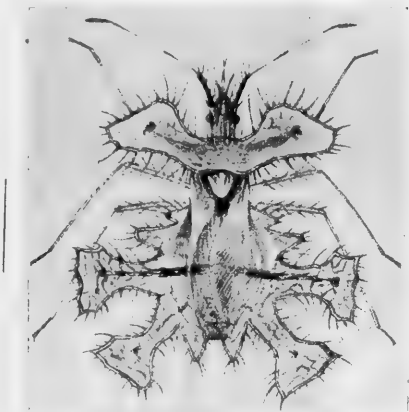
THE Phyllomorphinæ constitute a small subfamily of the Coreidæ, of which at present only three genera and some thirteen species are known to entomologists. They are in structure the most aberrant forms of all Coreids, and their phylogeny is quite unworked. Three species are recognized in the western Palæarctic region, and are located in the true genus *Phyllomorpha*. The two other genera, *Pephricus* and *Craspedum*, are almost entirely Ethiopian in distribution. Westwood described and figured an Indian species. We have evidently, at present, a very slight knowledge of the Phyllomorphinæ.

The old Swedish traveller in South Africa, Dr. Sparrman, who first discovered (1775) the curious *Pephricus paradoxus*, was impressed by its mimetic resemblance to a leaf. He narrates:—"At noontide I sought for shelter among the branches of a shrub from the intolerable heat of the sun. Though the air was now extremely still and calm, so as hardly to have shaken an aspen leaf, yet I thought I saw a little withered, pale, crumpled leaf, eaten as it were by caterpillars, fluttering from the tree. This appeared to me so very extraordinary, that I thought it worth my while suddenly to quit my verdant bower in order to contemplate it; and I could scarcely believe my eyes when I saw a live insect, in shape and colour resembling the fragment of a withered leaf, with the edges turned up and eaten away as it were by caterpillars, and at the same time all beset with prickles. Nature, by this peculiar form, has certainly extremely well defended and concealed, as it were in a mask, this insect from birds and its other diminutive foes."*

We know most about the European species. *Phylломорpha laciniata* has been well observed. Bolivar has described its stridulation and mode of carrying eggs;† and Giard has also written on its habits.‡

Pephricus fragilis, sp. n.

Varying in colour from pale creamy white to ochraceous; pronotum with the base slightly concave, the lateral lobes broadly gibbous anteriorly, their apices somewhat obliquely truncate, the abdominal lobes broad with their apices truncate, a more or less distinct transverse fuscous fascia crossing abdomen beyond middle and extending through the fourth and longest lobe; the upper surface varies in the number and position of some scattered small fuscous spots.



P. fragilis, Dist.

Long. ♂ and ♀ 12 millim.

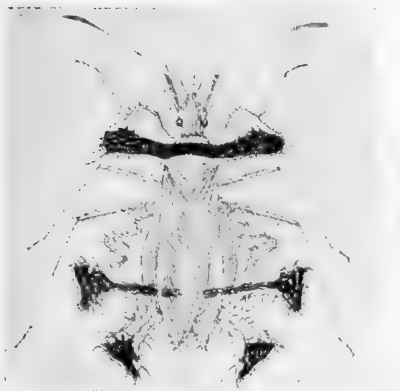
Hab. West Africa; N. Nigeria (G. Migeod—Brit. Mus.); Abyssinia (Brit. Mus.).

Allied to *P. pellicula*, Westw., but differing by the broader anterior angles of the pronotal lobes, &c.

* 'Voyage to Cape of Good Hope,' Engl. transl. 2nd edit., vol. ii. p. 16.

† Feuille Natural., xxiv. pp. 43-4 (1894).

‡ Bull. Soc. Ent. Fr. p. lxxix. (1895).

Pephricus fasciatus, sp. n.*P. fasciatus*, Dist.

Ochraceous; a broad fuscous fascia traversing the pronotum and its lateral lobes, and another crossing the abdomen and extending through the fourth abdominal lobe and occupying the whole of its apex; apex of the fifth abdominal lobe also fuscous. A few irregular scattered small fuscous spots on the upper surface.

Long. 11 millim.

Hab. West Africa (Brit. Mus.).

Allied to *P. livingstoni*, Westw., but differing by the truncate apices of the abdominal lobes, &c.

NOTES ON SOME COCCIDÆ OF THE EARLIER WRITERS.

By T. D. A. COCKERELL.

IN the course of my bibliographical investigations among the earlier works treating of Coccidæ, I have found so much that has been misunderstood by later writers, that it seems worth while to report the following results, although the more startling discoveries are not here mentioned, having been set forth in Proc. Acad. Nat. Sci. Philadelphia, 1899.

PULVINARIA VITIS (L.); *Coccus vitis*, L., S. N. x. 1758, p. 456. —This is the well-known *Pulvinaria* of the vine, well figured by Réaumur, whose figure is duly cited. *Calypticus spumousus*, Costa, Faun. Nap. 1829, is said to be the same, in which case *Calypticus* apparently takes the place of *Pulvinaria*, and the species becomes *Calypticus vitis* (L.).

PULVINARIA MESPILI (Gmel.); *Coccus mespili*, Gmel., Syst. Nat. 1788, p. 2221. —This is based on Geoffroy, Ins. Par. i. p. 508, No. 16. Fonscolombe in 1834 describes *Coccus cratægi*, Fb., and gives *mespili*, Geoff., as a synonym. Signoret says this is *mespili*, but not *cratægi*, which is *oxyacanthæ*, L. Fonscolombe's description evidently relates to a *Pulvinaria*. Signoret later referred Geoffroy's insect to *Pseudococcus* (i. e. *Phenacoccus*), which is evidently an error.

PULVINARIA SERICEA (Fourc.); on oak near Paris, *lanata*,

Gmel., is said to be the same. This is Geoffroy's oval and cottony *Chermes* of the oak.

PULVINARIA BETULÆ (L.); *Coccus betulæ*, L., S. N. x. 1758, p. 455.—Linné in the place cited gives no description, but refers to 'Fauna Suecica.' The latter work informs us that it occurs solitary on the branches of *Betula alba*, but still gives no description. Fabricius says of the insect, "corpus minutum, album," and cites only Linné. I have seen only the 'Fauna Suecica' of 1761, and do not know what an earlier edition may contain; but on the face of things there seems nothing to prove that the Linnean insect is the *Pulvinaria betulæ* of Signoret and authors, or even a *Pulvinaria*.

PULVINARIA CARPINI (L.); *Coccus carpini*, L., S. N. x. 1758, p. 455.—Signoret says this is the same as Réaumur's pl. vi. figs. 5, 9, 11. These three figures are all *Pulvinaria*, but fig. 5 is the type figure of *P. vitis*; fig. 9 is a species on oak, I suppose *P. sericea*; fig. 11 is the type figure of *P. oxyacanthæ*. It seems very doubtful whether the Linnean *carpini* can be identified, but Signoret's *carpini* is presumably identical with *Lecanium carpini*, Ratzeburg, Forstins. iii. p. 194, pl. ii. f. 6.

The whole question of the classification of the European species of *Pulvinaria* needs to be reconsidered, both as to the validity of the species, and the correct application of the names currently assigned to them.

LECANIUM, Illiger, in Burmeister, 'Handbuch der Entomologie,' ii. pt. i. 1835, p. 69.—The first species mentioned is *L. hesperidum* (L.), which must be regarded as the type. *Calymnatus*, Costa, with the same type, dates from 1827 or 1828, and therefore has priority, unless an earlier publication of *Lecanium* can be discovered. Scudder, following Agassiz, writes *Lecanium*, Burm., 1835, in the 'Nomenclator Zoologicus.'

The following species, hitherto placed in *Lecanium*, are the more typical members of *Calymnatus*:—*C. hesperidum* (L.), *C. longulus* (Dougl.), *C. minimus* (Newst.), *C. viridis* (Green), *C. schini* (Ckll.), *C. flaveolus* (Ckll.), *C. nanus* (Ckll.), *C. acuminatus* (Sign.), *C. terminaliæ* (Ckll.), *C. angustatus* (Sign.), and a few others. *Eulecanium* and *Saissetia* ought probably to be regarded as distinct genera.

EULECANIUM FUSCUM (Fourc.); *Chermes fuscus*, Fourcroy, 1785; *Coccus fuscus*, Gmel., 1788, in part.—Fourcroy's name is based on Geoffroy's account (Ins. Par. i. p. 507, No. 11); Geoffroy says the species seems not to differ from that of the elm, but he quotes Réaumur's pl. v. fig. 2, which has the appearance of a *Kermes*. Douglas (Ent. Mo. Mag. 1887, p. 98) declares that Réaumur's figure represents a *Lecanium* known to him, even in details of marking; but to me the shape and mode of attachment to the twig indicate a species of *Kermes*. Gmelin's account of the insect seems decidedly mixed, and he says of it,

"albo tomento obductus." His first citation of literature is "Modeer, Act. Gothenb. i. p. 24, § 18"; Douglas says that Modeer's insect is Geoffroy's *Chermes quercus reniformis*, i.e. *quercus* (L.), which is a *Kermes*.

EULECANIUM CORYLI (L.); *Coccus coryli*, L., S. N. 1758, p. 456. —Based on Réaumur's figures, which represent a very convex *Eulecanium*.

EULECANIUM ALNI (Modeer, 1778); *Coccus alni*, Gmel., Syst. Nat. 1788, p. 2221.—Gmelin's account is entirely based on that of Modeer. Compare Douglas, Ent. Mo. Mag., September, 1886, p. 80.

EULECANIUM VINI (Bouché); *Lecanium vini*, Bouché, Stett. Ent. Zeit. 1851, p. 112.—The description is extremely short, but it may be possible to determine the species.

EULECANIUM TILIE (L.); *Coccus tilie*, L., S. N. x. 1758, p. 456. —Based on Réaumur's figures; the species is well known.

EULECANIUM PERSICÆ (Fabr., 1766); *Coccus persicæ*, Gmel., Syst. Nat. 1788, p. 2220; Fabr. Ent. Syst. 1798.—We used to think we knew this species, but it has lately become involved in obscurity. Fabricius in 1798 describes it as found on the peach, and having "corpus medium, subrotundum, inæquale, brunneum." Gmelin does not quote Fabricius, and describes it as "nitens, rubicundus, spadiceus aut niger." He quotes Modeer, Geoffroy, and Réaumur. Réaumur's figures represent an undeterminable Lecaniine on peach. Geoffroy quotes Réaumur's figures, and says the insect is round and brown, with four "filets" at its tail! Modeer's insect is the *Coccus persicæ rotundus*, which is, I suppose, Signoret's *L. rotundum* (credited to Réaumur), this being identical with *L. prunastri*, Fonsc. Signoret's *L. persicæ* is Réaumur's *Coccus persicæ oblongus*. I have not access to the descriptions of the supposed synonyms *costatus*, Schr., 1781, *persicorum*, Ramer, 1789, and *amygdali*, Fourcroy, 1785. The last was doubtless founded on Geoffroy's account.

L. prunastri, as shown by mounted specimens kindly lent to me by Mr. Theo. Pergande, has antennæ varying from 6- to 7-jointed, the respective formulæ (omitting the first joint in each case) being 3 6 2 5 4 and 4 (2 3) 7 6 5. In the 6-jointed form the suture between joints 3 and 4 of the 7-jointed form is obliterated.

COCCUS CLEMATIDIS, Gmel., Syst. Nat. 1788, is based on Geoffroy's account of a coccid on clematis. It is apparently a *Lecanium*, but Geoffroy seems to have mixed up Lecaniines and mealy bugs in a hopeless fashion.

COCCUS UVA, Gmel., Syst. Nat. 1788, if a coccid, can only be a *Margarodes*. The description reads, "C. testa fusca sphaericogibba subflavescens," and it is stated to be found in Sweden

under stones. This is apparently taken from Modeer, whose insect has hitherto been referred with doubt to *Orthezia urticæ*.

COCCUS TUBERCULATUS, Bouché, Nat. der Insekten, 1834, p. 18, pl. 1.—Found on Malvaceæ, and probably from South America. It is certainly a Lecaniine, and probably a *Pulvinaria*; but I have never seen anything exactly as described and figured. The antennæ are figured as 10-jointed, and there is a row of small tooth-like objects down the back.

ASPIDIOTUS MYRTHI, Bouché, S. E. Z. 1851, p. 112, has been erroneously catalogued as a *Chionaspis*; it appears to be a *Mytilaspis*.

East Las Vegas, New Mexico, U.S.A. : Jan. 2nd, 1901.

THE STUDY OF LIFE-HISTORY.*

“I have gathered a posie of other men’s flowers, and nothing but the thread that binds them is mine own.”—MONTAIGNE.

“THE life of individual man is of a mixed nature. In part he submits to the free-will impulses of himself and others, in part he is under the inexorable dominion of law. He insensibly changes his estimate of the relative power of each of these influences as he passes through successive stages. In the confidence of youth he imagines that very much is under his own control; in the disappointment of old age, very little. As time passes on and the delusions of early imaginations vanish, he learns to correct his more sanguine views, and prescribes a narrower boundary for the things he expects to obtain. The realities of life undeceive him at last, and there steals over him at times the knowledge that the things he has secured are not always the things he expected.”†

Nevertheless, philosophically considered, the general trend of that life may be summed up in the one word “progression.” And, as with individual man, so it is with groups of men, for communities are influenced by the same disasters, or complete the same cycle as the individual. Many never pass beyond infancy, some reach the vigour of manhood, whilst others perish suddenly or die of sheer old age. But though during existence they may not infrequently encounter ill-fortune, or what is popularly designated “bad luck,” their absolute course can never be retrograde; in infancy, childhood, manhood, old age, it is ever onward. And as with communities in general, so it is with

* Address to the Lancashire and Cheshire Entomological Society delivered at the Royal Institution, Liverpool, on January 14th, 1901, by Vice-President E. J. Burgess Sopp, M.R.Met.Soc., F.E.S.

† J. W. Draper.

our own Society in particular—there can be no exception to the rule. Like an individual, it may experience its “ups and downs” of life, but—having successfully passed through the dangers incident to infancy and childhood, attained its majority, and (still under the able leadership of the respected President who has made it what it is) entered upon the vigorous growth of early manhood—its continued development and increased usefulness and prosperity can be looked forward to with the utmost confidence. This unchecked growth, or “healthy running on,” to use a horticultural expression, has imparted to the Society the same sound and healthful condition that it always does to the thriving plant; and just as, under like favourable circumstances, the latter is able to successfully withstand the very many trying vicissitudes to which it in its nature is exposed, so luckily is the Lancashire and Cheshire Entomological Society now far too strongly established to be injuriously affected by such ephemeral disasters as the possession of an inexperienced Vice-President or the delivery of a weak Annual Address.

To any member therefore who should happen to be present to-night for the first time, I would appeal that he judge not the calibre of the Society by this evening’s discourse, but rather regard the event as one of those momentary trials or adverse epochs in its history to which communities in common with individuals are exposed. To the older members I can only offer my condolences; like them, I sincerely regret the loss of the usual interesting Address by our worthy President, and still more deeply lament the cause which prevents him from being present amongst us this evening. Those of you who have so often enjoyed the great privilege of listening to the keen scientific observations and wealth of anecdotal experience of so veteran an entomologist as Mr. Capper will understand me when I say that although exceedingly attractive to listen to he is a difficult man to succeed, more especially for one who has so recently embarked upon the study of that branch of Natural History with which we are concerned this evening. Thus early does my difficulty begin.

A general survey of the entomological progress during the century just closed would have been desirable, but beyond me, and I thought it better to leave the matter untouched to a more able successor. A review of the work of the past twelve months had also to be abandoned, since owing to illness and other causes I have of late been sadly out of touch with the subject. Then in the presence of authorities like Mr. Pierce and the Rev. R. Freeman I could scarcely descant on the Lepidoptera, whilst it seemed equally presumptuous to address Dr. Ellis or Mr. Wilding on the topic of beetles. And alas! it is with the study of these two orders of insects that the majority of our members are concerned.

Since, then, it was obvious I could hope to discourse on little of interest to our older members, it struck me that as a comparatively young entomologist I might be permitted to address myself more particularly to the younger and less experienced students amongst us, and bring to their notice a few of the simpler of Nature's many secrets still awaiting solution at the hands of the zealous and thoughtful observer. By so doing I am not without hope that some may become sufficiently interested in the subject to eventually give more attention to a branch of the study of Zoology which appears somewhat neglected to-day—I refer to the study of life-history, an investigation requiring much careful training and long practice in observation, and which cannot therefore be well started too early in life.

This general neglect of attention to the living insect by beginners is easily understood. It matters not what order of Entomology we take up, our first endeavour is naturally to amass a collection; our next to get it named, classified, and arranged in the latest orthodox and most approved style. This is as it should be, provided always that the possession of such collection is not the object in itself; it should but serve us as a kind of illustrated catalogue to those wonderful little works of nature whose method of existence we should endeavour to fathom and understand. I think it was Bolingbroke, in his 'Letters on History,' who wrote:—"Some (histories) are to be read, some are to be studied, and some may be neglected entirely, not only without detriment but with advantage." The life-histories of insects undoubtedly belong to the earlier category, and should not only be read, but occupy a foremost place in any study of Entomology. True, the student of this branch of his subject has little to show of tangible form for much time and trouble expended. There will be few pocket-box exhibits for our energetic junior Secretary to insert in the monthly circular; no long columns of captures in the cabinet; and little enough for exchange: but on the credit side of his account will appear ere long ample and continually increasing compensation, with a wealth of genuine knowledge and pleasure to which the mere collector is for ever a stranger.

Far be it from me to underrate the work of classification. To H. T. Stainton and G. R. Waterhouse—who may perhaps be said to have been the first to reduce to a semblance of order the chaos existing in our lists of Lepidoptera and Coleoptera at the commencement of the nineteenth century—entomologists owe a deep debt of gratitude; and since their time so many and able have been the exponents of these groups along the same lines that their study has now been rendered comparatively simple. To such an extent indeed has the labyrinth of synonymy which formerly obtained been pruned, and to so great perfection has the general arrangement of the various groups of insects been

brought by the present generation of workers, that not only this Society but Entomology as a whole can now well afford to spare the labours of some of its younger and rising members, and should moreover encourage them, by every means in its power, to give increased attention to the important subject which I have ventured to bring to your notice this evening.

I have said *along the same lines*, but I do not admit those lines to be the best that could be desired. It is much more likely that the classification of our insects will eventually be considered historically; the ideal arrangement being based upon the development of internal structure and genealogy rather than upon any arbitrary divisions resting solely upon features of an external character as at the present day.

The study of life-history is in its broadest interpretation divisible into two portions, which may be conveniently described as—(1) observation of the habits of the living insect, and (2) the examination of its parts. The first of these can of course be pursued separately, but the diligent student who enjoys the advantage conferred by even a moderately good microscope will be well advised to combine the two, since some knowledge of the anatomy of his subject, no matter in how small a degree, will always be of great service to him in the intelligent interpretation of much in the life of an insect which may otherwise prove puzzling and obscure.

Of the systems of teaching of various naturalists with whose methods I have become acquainted, that of Döllinger, of Würzburg, was most successful; the fact that such men as Pander, Baer, and Agassiz were amongst his pupils speaks for itself. In our own times his system has been followed by the late Professor Huxley and other eminent workers; although at the present day the great bulk of zoologists in general—and I think I may add entomologists in particular—appear to be almost entirely engaged in renaming, reclassifying, and the rearrangement of generic and specific values, rather than in any systematic attempt to elucidate much that is as yet unknown of the habits and functions of the living animals themselves. That there are several distinguished exceptions I am well aware; their comparative smallness of number, however, seems but to accentuate the assertion advanced.

But that one epoch of life is not all life is a truism throughout the universe; and just as at one end of the chain of natural phenomena there are cycles or periods of time, at the expiration of which certain aspects of the giant heavenly bodies repeat themselves, and at the other well-marked though irregular and less understood recurrences of the abnormal assertion and activity of insect and other minute life; so, too, perhaps does the entomological student of life-history enjoy his periodicity, and in the fulness of time, through the exceedingly obscure albeit, usually

irresistible, force of fashion or other potent influence, may be evolved a race of entomologists whose chief aim and object will be the unravelment of the complicated skein of existence of living species rather than the collecting and arranging of their mummified forms after death. A list of such students, both in the past and present, includes many honoured names, of which it is only necessary to mention Malpighi, whose essay on the silkworm (1669) has been described as "an almost perfect example of an anatomical treatise in a new field" (Miall); Swammerdam, whose posthumous work 'The Book of Nature' contained the life-histories of many insects, of which perhaps that of the may flies (Ephemeridæ), although less quoted than the more elaborate dissertation on the honey bee, is the more valuable; Lyonnet, who has charmed us with his observations on the larva of the goat moth (*Cossus ligniperda*); Réaumur, the French naturalist, whose chief work, 'A History of Insects,' contains an admirable account of the caddis worms (Trichoptera); Straus-Dürckheim, whose classic exposition on the common cockchafer (*Melolontha vulgaris*) is a masterpiece of careful research; De Geer; Dufour; Newport; Leydig; Newman; Kirby; Professor Miall, to whom I am indebted for much of my knowledge of insect life; our member, Mr. S. L. Moseley, of Huddersfield, whose technical work in connection with injurious insects is known to you all; and last, but certainly not least, the distinguished lady whose membership is an honour to our Society, Miss Ormerod.

(To be continued.)

NOTES AND OBSERVATIONS.

TENIOCAMPA GRACILIS LAYING ITS EGGS IN A PIECE OF SPONGE.—On May 4th last I took a female of this species sitting in the daytime upon a frond of dead fern, and placed her in a large chip-box with a small piece of sponge saturated with syrup. She lived for a fortnight or more and then died, apparently without depositing any eggs, and I was on the point of throwing her and the piece of sponge away when something peculiar in the appearance of the latter caught my eye, and upon examining it closely through a lens, I discovered a quantity of eggs laid in the cells and placed some way in. They were of a pale straw colour when I first saw them, and remained so until May 28th, when they got a shade darker, and on June 1st I found many of the larvæ had hatched. They were then of a leaden hue, with shining black heads, and kept inside the sponge-cells, and I could not shake them out, so I placed the bit of sponge in a jam-pot with a piece of sawdust and covered them up; but the larvæ would not leave the sponge, and all died within the cells. I fancy they were held by the sticky syrup, and were unable to get out. This was unfortunate, but a piece of sponge seems to be a good thing to place in a box with moths that

do not readily lay in confinement, only, of course, the syrup must be omitted.—GERVASE F. MATHEW; Dovercourt, Essex, Feb. 11th, 1901.

SUGARING LAMPS.—Have there been any improvements lately in the manufacture of these lamps? If so, I should like to know. For the past two seasons I have been using one of the usual kind, as supplied by the dealers—one with bent glass front and burning a mixture of colza and American petroleum. It gives a fair light, but I think it might be vastly improved; the reflector seems to be a weak point. Has anyone invented any sort of electric lamp? I shall be glad to hear the experience of other collectors as to the best kind of lamp to use, &c., and where to obtain it.—GERVASE F. MATHEW; Feb. 12th, 1901.

PIERIS DAPLIDICE MIGRATING.—This species passed over here to-day (January 19th, 1901) in a large cloud, the time about 2·30, with a temperature of 101° in the shade. The butterflies appeared to be making for a north-westerly point; their progress was slow for such a high elevation, and the spectacle against the deep blue sky had the appearance as if studded with gems. On the ground they collected in batches where the spots were mostly damp and shady; towards sunset they had entirely disappeared.—H. W. BELL-MARLEY, I.L.I.; Ingagane, South Africa.

IRREGULARITY IN EMERGENCE OF DREPANIDÆ.—With reference to Mr. Leonard Spencer's observations on the length of time over which the emergence of *Drepana hamula* (*binaria*) extended (*ante*, p. 52), I may adduce for comparison my experience with *falcataria* (*falcata*). I had a fine brood last summer, which pupated between the 16th and 27th July. Some were forced at about 90° F.; of these about half emerged at various dates extending from five to fifteen days; the other half were placed at the ordinary room temperature about the 11th August, when I went abroad. I returned 8th September, and found all these had emerged and died during my absence, except one, which was living and in good condition, and therefore could not have emerged earlier than about the 5th September. Some others were kept from the beginning at the room temperature; about half of these emerged in from seven to thirteen days, the rest while I was abroad, except one, which did not emerge until the 9th December. Many others were placed within a day or so after pupation at various low temperatures, mostly at about 48° F., and kept there for about fifty to seventy days, being brought into room temperature at intervals between the 16th and 28th September. Many of these emerged while at the low temperatures, but many others at various times afterwards, several of them in November and December, and one on the 12th January; as I have some healthy-looking pupæ remaining, I expect more. The artificial cooling to which most were subjected was a cause of much retardation, but it will be observed that the extreme irregularity in the appearance of the perfect form was not confined to these. The regularity of appearance of some summer insects—for example, *V. io* and *V. polychloros*—contrast strongly with this; I have often found all that pupated on the same date emerge on one and the same day.—F. MERRIFIELD.

ERRATUM.—Page 55, line 28, for "Derbyshire" read "Denbighshire."

CAPTURES AND FIELD REPORTS.

LIMENITIS SIBYLLA &C., IN SHROPSHIRE. — In August, 1900, I saw a fresh-looking *L. sibylla* at Hopton Court, near Cleobury Mortimer, Salop. Also I found a caterpillar of the same species, but, unfortunately, it died. *Grapta c-album*, *Vanessa (Cynthia) cardui*, *V. io*, were very common during that month, especially the latter.—C. R. L. BOXER; 151, Burnt Ash Hill, Lee, Kent.

CIRRHÆDIA XERAMPELINA VAR. UNICOLOR IN THE MIDLANDS.—It may be of interest to record that, whilst living at Panton, in Lincolnshire, some forty miles from Nottingham, where Mr. A. Simmons took his specimen last year, I dug, in August, 1895, about twenty pupæ of *C. xerampelina*, under ashes, and from them had the good fortune to breed two lovely females of the var. *unicolor*. According to Mr. Tutt ('British Noctuæ and their Varieties,' vol. iii. p. 17), this form, besides occurring in Douglas, Isle of Man, has been recorded from Derbyshire, Gloucestershire, Staffordshire (Burton-on-Trent), and Yorkshire (Ripon). Staudinger, who gave it the name *unicolor*, describes it with terse accuracy as "alis anticis fere unicoloribus rufescentibus, flavo-bistrigatis." Guenée, who describes it as "var. A," but did not name it, says that the ground colour of the wings is a clear carnation red, and also remarks that the two sexes are similar. I find I have also a note that Mr. William Prest, of York, took one near that city, on Aug. 22nd, 1872. The ground colour is aptly described by him as being of a dull coppery red.—(Rev.) GILBERT H. RAYNOR; Hazeleigh Rectory, Maldon, Essex, Feb. 1st, 1901.

HYBERNIA PILOSARIA IN DECEMBER.—I took a fine specimen of *H. pilosaria* off a gas-lamp on Dec. 11th last.—CHARLES BAKER; Atherstone, Jan. 21st, 1901.

COLIAS EDUSA IN 1900, NEAR WINCHESTER.—I saw on the downs in the neighbourhood of Winchester, about Sept. 29th, a single specimen of *C. edusa*. This was the only specimen about, and I did not notice any clover or lucerne fields anywhere near.—ALAN W. CARDINALL; 18, Cromwell Road, Hove.

COLIAS EDUSA IN NORTHUMBERLAND.—On June 28th, 1900, I saw a single specimen of this butterfly on the roadside near Berrington, about seven miles south of Berwick. It was strong upon the wing, a male, in fine condition. I had expected to have seen others as in former years when the species has appeared here, but have not heard of a single other occurrence upon the eastern borders during the past season. The last previous occurrence of this species in the district of which I have any note was in 1884, when I saw one flying near Bamburgh, on July 14th. In 1877 it was numerous, and generally distributed.—GEORGE BOLAM; Berwick-on-Tweed, Jan. 28th, 1901.

COLIAS EDUSA AND ACHERONTIA ATROPOS IN NORTH ENGLAND.—During August, September, and October last, I was in different parts of Lancashire and Yorkshire, and saw *C. edusa* on one occasion only, that was on Aug. 14th, when I noted a specimen flying along the roadway by Cressington Park, five miles from Liverpool. I was told that the pupæ of *A. atropos* had been turned up in fair numbers by potato diggers in the Doncaster and Selby district.—G. B. OLIVER; Tettenhall, Wolverhampton, Feb. 15th.

ACHERONTIA ATROPOS IN WARWICKSHIRE.—Among the many interesting reports of *A. atropos*, I have not observed any from Warwickshire. During August I had five fine larvæ brought to me, which had been found in various gardens near the town, and also one large pupa, which was found in a coal-heap in a garden, where one of the larvæ had also been obtained. Of the larvæ two failed to pupate successfully, but the other three changed all right. I adopted the forcing plan suggested by Messrs. J. and W. Davis, and am pleased to say I was rewarded with three very fine imagines, two females and one male. It would be interesting to hear if many of those reported in the larval state have successfully attained the perfect stage, and in what proportion as regards numbers.—CHAS. BAKER; Atherstone, Jan. 21st, 1901.

ACHERONTIA ATROPOS IN NORTHUMBERLAND, 1900.—This species has been unusually numerous in this district, in common with other parts of the country, during 1900. The following captures of larvæ have come under my notice, all upon the English side of the Border, and I have no doubt many others have occurred:—Sept. 1st. One at Smafield station, upon the main line of railway between Berwick and Belford; another, at the same place, about a week later. 5th. One at Lilburn Tower. 20th. One from a garden at Wooler. 22nd. One from Plea Piece. 18th. One near Ancroft; one, Holy Island. October. One at Brock Mill, near Beal. A year seldom passes without one or two of these strange-looking caterpillars being found in the district, the imago being much less frequently seen.—GEORGE BOLAM; Berwick-on-Tweed, Jan. 23rd, 1901.

EARLY APPEARANCE OF CHEROCAMPA ELPENOR.—On Jan. 9th I received from my friend Mr. M. F. Thomas, of Brecon, a very fine specimen of this moth, and he also kindly sent me the following particulars. The caterpillar was found during the first week in August last, among some lilies-of-the valley underneath a climbing white jessamine; after trying several things it was found to eat lettuce leaves. It pupated the last week in August, and was kept in a cardboard box on the mantelshef of the smoking-room. The moth came out on Jan. 2nd. It is a beautiful specimen, perfect in every respect. Is not this a curious time of year for its emergence?—J. W. VAUGHAN; Bryn-y-Mon, Tenby, Jan. 12th, 1900.

THE VANESSIDS IN 1900.—The larvæ of *Vanessa urtica* were excessively abundant here last June and July, as usual, terribly ichneumoned. I noticed hundreds of their chrysalids hanging from copings of walls, &c., and collected several dozen, but not one produced a butterfly. However, in August and September the butterflies were tolerably common in clover-fields, but not abundant. *V. io* and *V. polychloros* were more numerous than usual, and *V. atalanta* was common, particularly in the larva state. Of *V. (Cynthia) cardui* I only noticed three—two very battered examples early in July, and one quite fresh on Sept. 5th. I was surprised there were not more of them, as they are usually plentiful during a clouded yellow year.—GERVASE F. MATHEW; Dovercourt, Feb. 11th, 1901.

NOTES FROM PORTLAND, 1900.—The following particulars respecting some of the best insects obtained here by me this season may be worth putting on record. *Colias edusa* was plentiful, and on the wing from Aug. 11th to Sept. 19th. I had one worn male brought me on June 12th, which I liberated. Of the variety *helice* I took six specimens. *C. hyale* I

captured here for the first time, netting six during the above period. Between Aug. 14th and Oct. 12th I had nine larvæ of *Acherontia atropos* brought me, the last two being only about one-third part grown, and these died. I took the first *Sphinx convolvuli* on Sept. 7th, and from this date until Oct. 9th I took seven others. On Sept. 25th I had a full-grown larva of this species brought to me, which had been dug up in a patch of potatoes. It went down again before I had time to examine it minutely, as I purposed doing, with a view to fully describing it. From the finding of this larva and the capture, some seasons, of a large number of the perfect insect, many in fine condition, I am inclined to think that the species breeds here. *Heliphobus hispidus* was out from Aug. 23rd to Oct. 7th, and I secured upwards of a hundred examples. Of *Aporophyla australis* I captured eighteen specimens, at sugar and on grass, between Sept. 21st and Oct. 7th. On Oct. 11th I took one *Epunda nigra* at sugar.—JOHN T. HYDE; The Grove, Portland.

LARVÆ-BEATING IN EPPING FOREST IN 1900. — Following on my previous notes published last year (Entom. xxxiii. p. 95), I append a short summary of larvæ beating in the above locality during the past year. The first excursion was on May 12th, to Loughton, and on this date the oaks were by no means in a forward condition. The day itself was bleak, and larvæ were few and far between; *Hylophila bicolorana* (three) was the most important item. On the 19th a similar journey resulted in an equal number of this species, and larvæ taken included *Crocallis elinguaris*, *Himera pennaria*, *Nyssia hispidaria*, and *Selenia tetralunaria*. On the 26th, walking through from Loughton towards the 'Wake Arms,' and beating suitable oaks, a very fair number of *H. bicolorana* were taken, ten in all. Many other larvæ were obtained, including the four above mentioned, and the more common things were fully as abundant as in the previous year. On June 2nd, isolated full-fed larvæ of *H. bicolorana* was the only species worthy of note. On the 9th, an excursion to Chingford, where the blackthorns came in for treatment, proved the fact that *Thecla betulæ* was well in evidence, and in point of numbers bid fair to outdo 1899. The larvæ were then very small; about twelve were taken, and more were to be had if one cared to work for them. *Miselia oxyacanthæ*, *Diloba cæruleocephala*, *Bombyx neustria*, *Odontopera bidentata*, were met with together, with a single *Trichiura crategi*. On the 16th *T. betulæ* was exceedingly common, and from this date to the 30th many larvæ were to be had. Several collectors were working, and all with some success. It is extremely gratifying to those who know its locality well, to find that, despite the popularity of the Forest as a place for school treats, military manœuvres, &c., this insect holds its own against all comers. I consider, personally, the working of the generally-known locality by entomologists will never be sufficient to exterminate it, owing, I think, to two breeding-grounds in the near neighbourhood which, I believe, are little known, and less worked, by the majority of collectors. Among things which fell into the tray on the 23rd was a beautiful female specimen of *Eurymene dolabraria*, and this was equalled on the 30th by a fertile female of *Angerona prunaria*, in perfect condition, which laid freely in captivity.

On July 14th, an excursion to Loughton, walking towards Theydon, resulted in some interesting larvæ; oaks, poplars, birch and willows were touched, and the captures included three *Pterostoma palpina*, two *Notodonta dictæa*, four *Lophopteryx camolina*, and three very small *Smerinthus*

ocellatus. On the 21st a further number of the above larvæ were taken, and others, including *Pygæra pigra* (?) and some *Eupithecia* larvæ (species unknown). On the 28th the most notable was a single *Macroglossa fuciformis*, which probably fell off honeysuckle.

On Sept. 7th a visit to the birches resulted in a single specimen of *Notodonta dromedarius*, three *Drepana falcataria*, five *D. lacertinaria*, and a few common larvæ.

To sum up, the year itself, so far as this locality is concerned, must be considered distinctly satisfactory; and though one regrets the absence of such larvæ as *Pæcilocampa populi* and *Thecla quercus*, yet the profusion of the others makes the Forest still worthy of the lepidopterist's attention.—E. W. LANE; 9, Teesdale Street, Hackney Road, N.E., Feb. 2nd, 1901.

LEPIDOPTERA IN CO. WESTMEATH.—As I have been collecting here for the last few years, a list of some of the insects I have met with may be of interest. Among others, I have taken the following species:—*Euchloë cardamines*, *Argynnis paphia*, *Melitæa aurinia*, *Vanessa io* (fairly abundant last season), *Thecla rubi* (very common), *Polyommatus phleas*, *Chærocampa porcellus*, *C. elpenor*, *Smerinthus ocellatus* (larvæ abundant), *S. populi*, *Macroglossa stellatarum*, *Trochilium crabroniformis*, *Ino statice*, *Gnophria rubricollis*, *Euchelia jacobæ* (extremely common), *Phragmatobia fuliginosa*, *Leucoma salicis* (abundant, but very localized), *Orgyia antiqua*, *Saturnia carpini*, *Cilix glaucata*, *Cerura furcula*, *C. vinula*, *Lophopteryx camelina*, *Notodonta dromedarius*, *N. ziczac*, *Pygæra pigra*, *Cymatophora duplaris*, *Bryophila perla*, *Acronycta megacephala* (pupæ not uncommon), *A. rumicis*, *A. menyanthidis*, *Tapinostola fulva*, *Xylophasia sublustris*, *Neuronia popularis*, *Luperina testacea*, *Mamestra furva*, *Apamea unanimis*, *Lampetia arcuosa*, *Miana literosa*, *Celæna haworthii*, *Agrotis saucia* (not uncommon last year), *N. c-nigrum*, *Triphæna interjecta*, *Nænia typica*, *Mormo maura*, *Panolis piniperda* (one), *Paehnobia rubricosa*, *Tæniocampa populeti*, *T. gracilis*, *Orthosia pistacina*, *Hadena dentina*, *H. pisi*, *Xylocampa areola*, *Calocampa vetusta*, *Xylina socia*, *Plusia bractea* (took eight specimens of this moth last season, and I have a number of the larvæ at present hibernating), *P. iota*, *P. pulchrina*, *P. festuæ*, *Erastria uncula*, *Euclidia glyphica*, *Eurymene dolabraria* (one), *Crocallis elinguaris*, *Biston strataria* (one), *Amphidasys betularia*, *Tephrosia crepuscularia*, *Abraxas adustata*, *Lobophora carpinata*, *Thera firmata*, *Melanthia albicillata*, *Phibalapteryx vittata*, *Coremia designata*, *Cidaria miata*, *C. siderata*, *Tanagra atrata*.—B. L. MIDDLETON; Belsize House, Mullingar, Ireland.

NOTES ON THE SEASON OF 1900 IN CARNARVONSHIRE.—Sallows at Capel Curig, in Carnarvonshire, were not very productive. *Tæniocampa stabilis* and *T. gothica* were abundant; and *Pachnobia rubricosa* occurred sparingly, along with a few *T. incerta*. The varieties of this insect, where it occurs among the mountains, seem to be very remarkable and confusing. I found *Melitæa aurinia* very common on June 10th, in one of the localities near here, where I discovered it six years ago. I was not able to repeat my last year's excursions to Dinas Rawddwy, in Merionethshire, where, in June, 1899, I captured between forty and fifty fine *Chærocampa elpenor*, at rhododendron bloom. They swarmed in scores at one small bush, along with a few specimens of *C. porcellus*. Sugar has been totally unproductive all the year, and light nearly as bad. Among the butterflies, *Vanessa io* has been very abundant this summer; *V. c-album* I saw twice.

I have, however, one addition to record to our small list of butterflies here. One of my boys, Master George Rowlands, took five specimens of *Thecla betulae* in August, in a lane close by, which I have often worked myself, though without any such result. I was rather incredulous at first when I heard of its occurrence here; but I have seen the specimens, one male and four females, all rather worn. Larvæ and pupæ of *Acherontia atropos* have been found occasionally during the autumn in the neighbourhood.—A. S. TETLEY; Newtown, North Wales, Dec. 15th, 1900.

CAPTURES AT ELECTRIC LIGHT.—As Bucks appears to be a county which is little worked, a list of captures taken at electric light during the last year may prove interesting. We were only able to work the lamps on a few Saturday evenings in the months of May, June, and October, but we were able to give them more attention from July 20th to the end of September, with the exception of the first fortnight of August. Nearly all the moths enumerated were taken at five arc-lamps in the middle of the town, and the results would doubtless be better if the current were not switched off punctually at 11 o'clock. The only points worth noticing are the capture of *E. jacobææ* on April 21st (an early date), and the abundance of the "Thorns." *S. illunaria* (common), *E. tiliaria*, *E. fuscantaria* (common, but in poor condition), *E. angularia*, and *E. erosaria*, whilst one *H. pennaria* was taken on Nov. 3rd. Thirteen *C. xerampelina* turned up in September, and two *L. quercifolia* and one *N. trepida* in June. The following is a complete list of the species which were taken, one hundred and eleven in number:—

Sphinges:—*S. ligustri*, *S. ocellatus*.

Bombyces:—*L. complanula*, *E. jacobææ*, *A. caia*, *S. fuliginosa*, *S. lubricipeda*, *S. menthastri*, *H. humuli*, *H. lupulinus*, *L. auriflua*, *D. pudibunda*, *B. neustria*, *P. populi*, *T. cratægi*, *L. quercifolia*, *P. unguicula*, *P. hamula*, *P. falcula*, *C. spinula*, *N. dictæa*, *N. trepida*, *P. bucephala*.

Noctuæ:—*A. psi*, *D. cæruleocephala*, *L. conigera*, *L. comma*, *L. impura*, *L. pallens*, *C. lutosæ*, *A. putris*, *X. lithoxylea*, *X. monoglyphæ*, *N. saponariæ*, *N. popularis*, *C. cytherea*, *L. testacea*, *M. brassicæ*, *M. persiciariæ*, *A. basilinea*, *A. didyma*, *G. trilinea*, *C. morpheus*, *C. alsines*, *A. puta*, *A. suffusa*, *A. segetum*, *A. exclamationis*, *A. corticea*, *N. plecta*, *N. c-nigrum*, *N. xanthographa*, *T. ianthina*, *T. subsequa* (one), *T. orbona*, *T. pronuba*, *A. pyramidea*, *M. maura*, *P. rubricosa*, *T. gothica*, *T. instabilis*, *T. stabilis*, *Orthosia macilenta*, *A. litura*, *A. pistacina*, *A. lunosa*, *X. ferruginea*, *X. citrigo*, *X. flavago*, *X. fulvago*, *X. aurago*, *C. xerampelina*, *D. cucubali*, *H. serena*, *P. flavicincta*, *E. nigra* (one), *P. meticulosa*, *H. trifolii*, *H. oleracea*, *H. genistæ*, *X. lithoriza*, *C. umbratica*, *H. triplasia*, *P. chrysitis*, *P. gamma*, *P. iota*, *A. tragopogonis*, *C. nupta*.

Geometræ:—*M. sambucaria*, *R. cratægata*, *S. illunaria*, *C. elinguaris*, *E. tiliaria*, *E. angularia*, *E. erosaria*, *E. fuscantaria*, *A. pennaria*, *H. abruptaria*, *A. grossulariata*, *H. progemmaria*, *H. defoliaria*, *A. æscularia*, *C. brumata*, *O. dilutata*, *A. betularia*, *B. rhomboidaria*, *M. sociata*, *M. montanata*, *M. fluctuata*, *C. associata*, *C. pusaria*.—F. H. & G. E. PEACHELL; High Wycombe, Bucks, Dec. 30th, 1900.

NOTES FROM THE NORTH-WEST.—Again has the season been one of such considerable interest, if not of surprises, that I am tempted to continue a list of the more important observations, the last of which appeared in the 'Entomologist' for June (xxxiii. 182).

May.—Looking through my manuscript notes for the last ten years, I have been struck by the occurrence of a May storm about the middle of the month. The only exception worth notice was in 1892, when fine weather broke up, with rain and north-east winds, on the 3rd. Generally speaking, the trouble is one of cold, high winds with rain, and even snow—"winter lingering in the lap of May"—but, on three occasions—1895, 1898, and 1899—the storm was one of thunder and lightning. This year (1900) we had the cold week, with the wind north-east, about May 17th. As "the weather" is always a matter of moment to entomologists, these remarks may be of interest. The only other thing worth referring to under this month is a *Euchloë cardamines*, which I saw flying along Eastgate Street, Chester, on the 20th.

June.—*Heliaca tenebrata (arbuti)* was plentiful on the hedge-banks this year; I took a dozen along a few yards, and in a few minutes, on the 4th. On the 1st I saw the dragonflies, *Ischnura elegans* and *Agrion puella*—just out—flying together. A delicate pink suffusion on the thorax, particularly in the case of *A. puella*, showed they were immature. *Enallagma cyathigerum*, *Libellula quadrimaculata*, and *Leucorrhinia dubia* appeared on the Delamere heaths, but also immature, on the 23rd. *Pyrrhosoma nymphula* (= *Agrion minium*) was well out on the 30th. A common beetle on the Delamere heaths, in June, is the handsome and variable *Cicindela campestris*. The night-feeding larvæ taken in Delamere Forest from willow, birch and hawthorn, on April 28th (Entom. xxxiii. 182), began to appear on June 11th as perfect insects. Among them were six or eight *Aplecta nebulosa*, including three black forms. The Delamere type is a much darker moth than the one I come across in North Wales—say, in the county of Merioneth. That from Delamere is about as dark as *A. occulta*, whilst the Merioneth one is about as pale as *Polia chi*. A new and successful experience in June was the searching for moths, with the aid of a lamp, on flowers, particularly those of the campions, and of hogweed (*Heracleum sphondylium*). I have a lively recollection of those quiet and beautiful June nights—all the world asleep—and the seas of great white scented trusses of flowers flecking the sides of the lanes and river embankment. We took no rarities from these hogweeds, but they were well worth working by anyone who wished to renew common species. Foremost among these, in abundance, were *Axylia putris*, *Noctua c-nigrum*, *N. festiva* (with endless varieties), *Agrotis segetum* (equally as variable—the females often with red margins), *A. exclamatoris* (with pale to almost black forms). *Triphana pronuba* in all sorts of shades and patterns, the mottled variety of *Apamea gemina* (often taken for *Mamestra furva*), and, of course, the type and varieties of *Xylophasia rurea*. The best geometers, and there were plenty of them, were *Timandra amatoria*, *Emmelesia decolorata* and *Eupithecia castigata*, the last species being a new record for Chester. At campion flowers we took, amongst others, *Dianthæcia cucubali*, aglow with marginal purple band and yellow streak—alas! they fade. Other moths at campion flowers were *Plusia pulchrina* and *E. venosata*. One night, or rather morning (but this was in July), we strayed among some fields, on the way home, to visit a growth of marsh mallows. The flowers were closed, but seven larvæ (night-feeders) of *Eubolia cervinata* were secured. From these I had five moths between the 19th and the end of September. A double surprise, this month, was the abundance of *Lycæna ægon* and *Zygæna filipendulæ* in the Delamere Forest district. The butterfly was out in hundreds on the 30th, but all males, and flying in company with

L. alexis. The dark marginal shading of the lower wings, in the Delamere form, is often replaced by seven black spots. These spots also appear in the females, and enclosed in crescents of orange-red, frequently repeated less distinctly on the margins of the upper wings; the orange-red is often entirely absent in this sex. All these marginal spots and crescents I found most pronounced in specimens obtained at Abersoch (Carnarvonshire). The females were abundant on the 19th of July; and it was an interesting sight to see them all asleep on the heather-tops, at Delamere, at five o'clock in the afternoon, both sexes, and in every case head downwards. Coming back to June 30th, I picked thirty-four cocoons of *Z. filipendulæ* from the heather, in the hope of getting the variety with the lower wings orange. Years ago, from a dozen or more larvæ taken a few miles from Chester, I reared a couple of examples of this orange form. I have never seen the variety since. From the thirty-four cocoons several of the moths appeared with the two apical spots on the upper wings confluent. From nineteen larvæ of *A. ashworthii* I had nine moths in June and July—a poor result! Mr. Gregson used to say the species would never become extinct, but, as far as my experience goes, it is decidedly becoming scarcer, either as larva or imago. Acting upon information, as our friends the police would say, I examined, accompanied by another brother of the net, on June 18th, the flowers of the goat's-beard on the Dee embankment for larvæ of *Hecatera serena*. We were too late; but scores upon scores of the flower-heads had been hollowed out, presumably by these caterpillars. At the electric lamps history repeated itself, but, throughout the whole season, not so liberally as in last year. We had not the continued high temperature of last year. I took a specimen of *Chariclea umbra* (*Heliothis marginata*) on the night of June 5th. Mr. A. O. Walker's record for the insect is—"Wallasey; New Ferry; generally scarce. Rhyl." On June 6th I captured a fine, fresh, but much belated *Tæniocampa gothica*. Some years ago I netted a *T. stabilis*, also in June. *Tephrosia crepuscularia* should be classed among late appearances, as the species was continuously seen in April, May, and June. Two fresh specimens, dark forms, we captured in Delamere Forest on June 9th.

July.—On the 19th we netted four worn specimens and one good example (the last a female) of *Canonympha davus* on a Delamere heath. Among dragonflies *Lestes sponsa* was more abundant than ever, *Æschna juncea* and *Sympetrum scoticum* were just out, and *L. dubia* was nearly over. On the 24th I was among the Denbighshire Lepidoptera. I particularize the date, as it was one of the hottest in the summer, and I shall probably never forget its pleasures. One of my experiences was standing on a limestone precipice. There was a very abrupt, but friendly, slope; for a perpendicular descent is calculated to disturb humanity. Wherever the *débris* had lodged was a wealth of flowers of all colours, and the butterflies came sailing up in dozens at a time to taste their sweets. Three times higher than the sycamore-trees below stood I, and yet I was tempted to descend to the flowery beds and net *Vanessa cardui*, *Satyrus semele*, *Lycæna astrarche* (*agestis*), and other butterflies. But discretion is the better part of valour. On the hilly slopes about, *Herbula cespitalis*, *Ennychia cingulata* (*cingulalis*), *Crambus inquinatellus*, and *Leioptilus osteodactylus* were common. *Mimæseoptilus bipunctidactyla* was abundant, in the middle of the month, about the Chester hedgerows. My best captures at the electric lamps were *Chærocampa elpenor*, *A. nigricans* (not at all a common insect with us), *Melanthia bicolorata* (*rubiginata*), *Nephopteryx spissicella* = *roborella* (a

new, district record), and *Rodophæa consociella*. Out of thirteen larvæ of *Callimorpha hera* I had seven alive at the end of April, and four of these died. Three moths emerged on the 17th, 19th, and 20th of July. So much for keeping hibernating larvæ indoors! Few people are aware what a good beetle we have at Chester—the small cockchafer, *Melolontha solstitialis*; and it is plentiful, though local. I got twenty in half an hour or so on the evening of the 17th, and sent them off to a coleopterist who was without the species. It frequently comes to the electric lights.

August.—As in May, there is commonly a serious and general break in the weather during the first fortnight, usually about the 12th. On the 3rd a friend and I made an early start for the Wirral. Hardly had we got to work amongst the Lepidoptera, when a black and angry-looking cloud was seen coming rapidly over the horizon from the south-east: the storm-path here is usually from south-east to north-west, and *vice versa*. *Epinephele tithonus* was out in such gratifying numbers that we anticipated varieties; but they were flying heavily and evidently looking about for shelter. We were out in the open country, and it was too apparent that time only admitted of hurrying to the only available haven, a railway-bridge spanning a cutting. Just in time, and then came the thunder, lightning, waterspout and semi-darkness! We were in a state of siege for hours, for the storm was driven back again from the coast by a fierce Atlantic gale. This was the break-up of the weather, and entomology had to wait for quite a week. *Colias edusa* was first observed on the 17th. Weighing the evidence at hand, and trying to avoid anything undigested, I should say the subsequent numbers of the butterfly were not due to migration but to climatic and other circumstances favourable to the insects. I believe that they are with us always. Besides, the migratory theory is always exposed to the query, Where did they come from? *Luperina cespitis* appeared at the electric lamps on the 14th, and *Notodonta dromedarius* on the 17th. The last species had been continuously emerging from the chrysalis since the 1st of June, and I am therefore inclined to put the insect captured on the 17th down to a retarded emergence. On the same date I took at the lamps a fine fresh specimen of *Hydræcia petasitis*—new to Chester; and my friend Mr. Hargreaves (Mr. Cattermole), of the “Private Secretary” Company, captured an *Aplecta occulta*—also new to Chester—on the 28th. *Xanthia xerampelina* is worth mentioning, in August, as a moth not quite so scarce as in previous years. Amongst the beetles at the lamps was *Necrophorus ruspator*. The dragonfly *Æschna grandis* has been common as usual during the summer.

September.—I had found many species of larvæ so scarce during the season that I paid a visit to Delamere Forest on the 15th. Here the birch-feeders, at any rate, were well represented. Brilliantly coloured are many of them, and distinguished in appearance. *N. camelina* was very common, including the rose-coloured variety. The same observation applies to *N. dromedarius*; its red form, with the tips of the humps a flaming crimson, is indeed a handsome caterpillar. *Dasychira pudibunda* was also beaten from the birches: where is there a handsomer caterpillar, with its delicate birch-green, its velvet-black segmental divisions, its four pale straw-coloured, brush-like tufts or ornaments, its radiating groups of golden hairs, and anal plume of maroon or purple? There were examples in plenty of a whitish or very pale green larva, almost white below, with legs and claspers of the same tint. The dorsal surface was a dark olive-green, the head light reddish, and there was a shining black shield on the

second segment. It reminded me of *Asphalia flavicornis*, and I fancy it will turn out to be *Cymatophora duplaris*. Larvæ of the odd-shaped *Drepana falcataria* were numerous, clad in apple-green with a chocolate dorsal mantle. Some great, brown, sooty-looking fellows, with little regard for their personal appearance in the way of ornament, occasionally dropped into the umbrella. I put them down as *Amphidasys betularia*, but many species of caterpillars vary very much. Amongst hybernating larvæ were *Porthesia similis* = *Liparis auriflua* (they spin a little cocoon for their winter covering), *Geometra papilionaria*, and *Bombyx rubi*. The last were ceaselessly travelling, as usual at this time of the year, and I let them go on in search of their resting-places. *G. papilionaria* are now (Nov. 12th) resting nearly upright on their anal claspers, at an angle of about 30°, upon birch twigs, for all the world like twiglets or birch buds. This may be an attitude of protective resemblance against birds, but it certainly fails against ichneumons. Another visit to the forest on the 29th found all these species still present, though in diminished numbers, except *G. papilionaria*. They had evidently left the terminal twigs from which I had beaten them on the 15th. Ragwort flowers produced, on this occasion, two species of *Eupithecia* caterpillars: (1) delicate, reddish brown, with six paler, oblique marks on each side, and four darker, reddish-brown diamonds dorsally; (2) pale yellow, with varieties pale green and pale brown; five halberd-shaped, brown arrowheads dorsally, pointing towards the head. Female gnats or mosquitoes—for a gnat is a mosquito either under the microscope or by its life-habits—were almost insufferable during this visit. It is the female alone which “stings,” for she alone possesses the five lancets hidden away in the long sucker or proboscis; and it is the female only which emits the sharp, well-known cry, from what I believe to be musical spiracles. On July 19th, my friend and I were among myriads of males flying in and out among each other, and low over the heather, as in a vast quadrille. There was not a sound from them, and there was never a “bite”! Seen under a lens the mosquito is a beautiful insect. One cannot help admiring its pale ashy grey, relieved by six broad equidistant black bars, the fourth being the widest. The two wings, with their delicate fringes, are a study in themselves, and the feathered antennæ of the males compel one’s admiration. The female antennæ appear simple, except under the microscope. I captured a fine specimen of the dragonfly *Sympetrum striolatum* (= *Libellula vulgata*) in the forest on this date. *Æ. cyanea* was taken close to Chester, and brought to me on the 22nd. Near the city, on the 9th, I saw a remarkable form of the butterfly *Pararge megæra*, but failed to capture it. It had a broad median black patch or bar, one-third the width of the upper wing, and stretching from the base to half the length of each primary. The extraordinary moths taken at the electric lights in September were *Nonagria lutosa* and *Xanthia gilvago*, both new to Chester. The second broods of *P. festuæ* and *N. c-nigrum* appeared about the middle of the month.

October.—The only capture worth alluding to was the water-beetle *Dytiscus punctulatus* and a female *Eugonia* (*Ennomos*) *fuscantaria*, both of which I took at the electric lights. The moth laid a number of fertile eggs.

November 2nd.—The season closed with *P. gamma* before the curtain.

I should mention that four beautifully fresh male specimens of *Zeuzera pyrina* (*æsculi*) and one example of *Gnophria quadra*, both species new to the district, were taken at the electric lamps here, but not by myself.—
J. ARKLE; 2, George Street, Chester.

NOTES ON THE SEASON.—The season of 1900 has undoubtedly been a remarkable one in many ways. Among other things, the abundance of *Lycæna argiolus* and *Colias hyale* was very marked. At Lee several insects turned up which I have not taken there before, and others which had disappeared during the last few years. In June a few larvæ of *Leucoma salicis* were taken, and the imago appeared at light in July. In July, among other things, *Macroglossa stellatarum*, which I have never seen here before, was taken in the garden, and thirteen larvæ were found on a small patch of *Galium verum* about one square yard in extent. *Zeuzera æsculi* (Catford), *Cossus ligniperda*, *Nola cuculatella*, *Abrostola triplasia* (fairly common—I had not noticed it for the last two seasons, though formerly abundant), and a single very fine and large *Scotosia dubitata*, which is curious, as there is no buckthorn very near here, and I have failed to feed the larva on any other food-plant. A fine pair of *Amphidasys betularia* was taken. Larvæ of *Cucullia chamomillæ* were present in a large chamomile field, but some very hard work with Mr. R. L. Hewitt only produced two larvæ, both of which fell to his sweep-net. It was a blazing hot day, and my share of the spoils was a huge collection of chamomile seeds down my back. In August the following were among the principal Lee captures:—Larvæ of *A. betularia* and *Ennomos fuscantaria* (Catford); imagines: *Hepialus sylvinus*, *Agrotis suffusa*, *A. nigricans*, *A. puta*, *Hydræcia nictitans*, *Cerigo matura*, *Noctua plecta*, *N. c-nigrum*, *Tethea subtusa*, *Pyrallis costalis*, *Endotricha flammealis*, and *Cataclysta lemnata*. In September *Colias edusa* was seen at Blackheath, and reported from Hither Green. *Agrotis suffusa*, *Noctua c-nigrum*, *Anchocelis litura*, *A. lunosa*, *Ennomos tiliaria*, *E. fuscantaria*, and *Anaitis plagiata* were taken. In October *Hydræcia micacea*, *Anchocelis pistacina*, *Hypena rostralis*, *Himera pennaria*, and *Oporabia dilutata* were noticed; and in November *Himera pennaria*, *Hybernina defoliaria*, *Oporabia dilutata*, and *Cheimatobia brumata*. A good many of the above species I have never taken here before, though I have been collecting here for some years past. *Mania maura* and *Catocala nupta* were both common, as usual, but I missed *Nænia typica* this year.

Our first visit of the season was, as usual, paid to Bexley, on February 24th; the result of a short search on tree-trunks being a male *Phigalia pedaria* and a goodly number of *Hybernina leucophæaria*, including one female; the males were, as usual, variable. The following day my father (Mr. F. B. Carr) and I paid a second visit to the same locality, taking several more male *H. leucophæaria* and one female, also another *P. pedaria*; and on the new fences on Dartford Heath *Anisopteryx æscularia*, *Hybernina progemmaria*, and *H. rupicaprararia*.

A walk to Mottingham and Chislehurst on April 1st was only productive of *H. progemmaria* and *Diurnea fagella*; and a visit to Addington on the 7th produced *A. æscularia*, *H. progemmaria*, and larvæ, from oak-stumps, of *Sesia asiliformis* (*cynipiformis*), for which larvæ we revisited the same spot the next day, and took *Asphalia flavicornis* as well.

A visit to Bexley on April 21st was on one of those most delightful spring days which we so seldom get. *Pieris rapæ* and *Lycæna argiolus*, *Taniocampa cruda*, *Vanessa urticæ*, and *Diurnea fagella* were noted. On the 29th a few hours were spent at Bexley. One *Xylocampa lithorhiza* was the only imago seen, but the following larvæ were taken:—*Nola cuculatella*, *Xanthia cerago* (from which one var. *flavescens* was bred), *Miselia oxyacanthæ*, *Rumia luteolata*, *Hemithea thymiaria*, and *Cheimatobia bru-*

mata. The afternoon of May 5th I spent by myself at Oxshott. Males of *Saturnia carpinii* were flying furiously over the heath, but all attempts to catch them were unsuccessful. *Anarta myrtilli*, *Eupithecia nanata* (very abundant), and *Fidonia atomaria* were also about; also larvæ of *Xanthia cerago* and *Thera variata*. A week later Oxshott was again visited, but it was horribly cold, and the following insects were noticed:—*Eupithecia nanata*, *Fidonia atomaria*, and single specimens of *Drepana lacertinaria*, and *Zonosoma (Ephyra) pendularia*. A very bad specimen of *Agrotis puta* was found at rest near the station. Larvæ taken were *Agrotis agathina* (five), *Metrocampa margaritaria*, *Oporabia dilutata*, and *Cheimatobia brumata*. With regard to larvæ of *A. agathina*, both in the New Forest and at Oxshott I have taken them by sweeping the heath under pine-trees, and not right out in the open. We managed to feed them up on plum, which should prove a useful substitute.

A walk to Chislehurst with my father the next day (May 13th), produced *Xylocampa lithorhiza*, *Ligdia adustata*, and a very fine *Anticlea badiata*, with larvæ of *Cleoceris viminalis*, *Orthosia lota*, &c. On May 20th a short time at Bexley produced *Lycæna argiolus* and *Pieris rapæ*, and larvæ of *Thecla quercus*, *Cleoceris viminalis*, *Orthosia lota*, &c. Six days later the same locality produced *Argynnis (Brenthis) euphrosyne*, *Drepana falcatoria*, *Tephrosia luridata (extersaria)*, *Zonosoma porata*, *Cabera pusaria*, *Asthena candidata*, and *Melanippe montanata*, and larvæ of *Hybernia aurantiaria* and *Oporabia dilutata*. May 27th, at Bexley, produced *Pieris rapæ*, *P. napi*, *Euchloë cardamines*, *Vanessa io*, *Lycæna argiolus*, *Rumia luteolata*, *Venilia maculata*, *Tephrosia punctulata*, *Ligdia adustata*, *Panagra petrararia*, *Zonosoma punctaria*, *Melanthia ocellata*, and larvæ of *Hylophila bicolorana*, *Phigalia pedaria*, *Hybernia defoliaria*, *Calymnia (Cosmia) trapezina*, &c.

The afternoon of June 16th was spent with the South London Entomological Society at Chipstead and Banstead. *Lycæna icarus*, *L. agestis*, *Cænonympha pamphilus*, *Smerinthus tiliaë*, *Bapta temerata*, *B. taminata*, *Eupithecia centaureata*, and larvæ of *Scotosia dubitata* and *Tæniocampa gracilis* falling to my lot. The same day my father took *Tephrosia punctulata* and *Cabera pusaria* with larvæ of *Bombyx neustria* and *Tæniocampa stabilis*, at St. Paul's Cray.

A short time spent at the much-worked Bexley on June 17th and 18th produced the three common Pierids, *Vanessa atalanta*, *Cænonympha pamphilus*, *Hesperia sylvanus*, *Halias prasinana*, *Acronycta aceris*, *Hadena dentina*, *Zanclognatha grisealis*, *Tephrosia punctulata*, *Iodis lactearia*, *Cabera pusaria*, *Asthena candidata*, *Acidalia bisetata*, *A. remutaria*, *Zonosoma punctaria*, *Z. porata*, *Panagra petrararia*, *Camptogramma bilineata*, *Melanippe montanata*, *M. subtristata*, and *Coremia unidentaria* (?).

On July 6th I walked to the Crown Woods, Eltham, and noticed on palings and tree-trunks *Acronycta aceris*, *A. psi*, *Hecatera serena*, *Aplecta nebulosa* (rather dark), *Boarmia repandata*, and *Acidalia aversata*, whilst *Epinephele ianira* flitted about the hedges, despite a thunderstorm. On the 8th my father took *Phorodesma bajularia*, and larvæ of *Ligdia adustata* at Bexley. On the 9th a walk to Mottingham produced, among other things, *Cucullia umbratica*.

July 11th, a very hot, fine day, was spent at Oxshott. *Vanessa atalanta* was seen. *Epinephele ianira*, *Cænonympha pamphilus*, and *Hesperia sylvanus* were all very common, but *Lycæna ægon* was quite fresh, and only males were netted. *Macroglossa stellatarum* was observed hovering about

the sides of the sand-pit. A few *Euthemonia russula* were taken, including one female, which obliged us with fertile ova. *Drepana falcataria* (worn), *Agrotis porphyrea* (worn), *Xylophasia polyodon*, *Plusia gamma* (worn), *Erastria fuscula* (*fasciana*), *Uropteryx sambucaria*, *Ellopiia fasciaria* (*prosapiaria*), *Geometra papilionaria* (a grand male, beaten from birch), *Fidonia piniaria* (one male, females common), *Cabera pusaria* (very abundant), *Melanthia ocellata*, *Melanippe subtristata*, *Lomaspilis marginata*, *Acidalia aversata*, *Thera variata*, and *Macaria liturata* complete the list of imagines. *Tenioecampa stabilis*, *Trachea piniperda*, *Anisopteryx æscularia*, and *Zonosoma punctaria* were the only larvæ noticed.

On July 14th a full day was spent in the company of Messrs. F. Enock and W. J. Lucas at the Black Pond, Esher. On the way to the pond from Claygate Station the following species were noted:—*Epinephele ianira*, *Cænonympha pamphilus*, *Lycæna ægon*, *Hesperia sylvanus*, *Calligenia miniata*, *Erastria fuscula* (*fasciana*), *Ellopiia prosapiaria*, *Fidonia piniaria*, *Cabera pusaria*, and *Acidalia aversata*. Arrived at the Black Pond, *Anax imperator* occupied most of our time, but, though fairly common, one only was taken. *Pyrrhosoma tenellum* was common, but only a few *P. nymphula* were seen. *Enallagma cyathigerum* was another common dragonfly, and one *Æschna grandis* was observed. *Libellula quadrimaculata* was not uncommon, and I had the pleasure of taking var. *præ nubila* (Newm.). *Calligenia miniata*, *Agrotis porphyrea*, and a larva of *Trachea piniperda* were taken. After the usual tea at Oxshott, we walked back to Claygate, putting in some very successful dusk on the way. *Hepialus hectus* was common, and *Calligenia miniata*, *Angerona prunaria* (males), and *Melanthia rubiginata* fairly so. Three male *Phorodesma bajularia* were netted, but only one was worth keeping. One *Acidalia emarginata* was taken. *Cidaria fulvata* was fairly common, whilst *Hemithea thymiaria* was very abundant. A single specimen of *Hypena proboscidalis* was seen. The best catch of the day, however, was a specimen of *Calymnia* (*Cosmia*) *pyralina*, which had freshly emerged, and had not spread its wings when taken, but afterwards developed into a fine specimen. With Claygate now before us, nets were put away, and a most successful day came to an end.

The evening of July 18th was spent with Mr. R. L. Hewitt at Bexley. There was very little about. As at Oxshott, *Melanthia rubiginata* flew in large numbers at dusk. *Calligenia miniata*, *Triphæna pronuba*, *Hemithea thymiaria*, *Cabera pusaria*, *C. xanthemata*, *Acidalia aversata*, *A. osseata*, *A. bisetata*, *Lomaspilis marginata*, *Larentia didymata*, and *Endotricha flammealis* (very abundant) were also noticed. Treacle was a failure; but, while waiting for our train at Bexley Station, *Leucoma salicis*, *Nola cucullatella*, *Axylia putris*, *Hecatera serena*, *Caradrina morpheus*, *Xylophasia polyodon*, and *Eupithecia subnotata* were boxed off the lamps in about ten minutes, making one wish that one were manipulating a light in the fens.

Thanks to the invitation of a friend, a very jolly week-end (July 21st to 23rd) was spent at the picturesque village of Westcott, near Dorking. The weather was grand. *Pieris brassicæ*, *Epinephele ianira* (very abundant), *E. tithonus*, *E. hyperanthus*, *Cænonympha pamphilus*, *Vanessa urticæ*, *V. polychloros* (about half a dozen, and a pupa, found on a wall—the imago emerged the same day), *Lycæna argiolus* and *Hesperia thaumas* were all the butterflies noticed. Of the moths, two examples of *Macroglossa stellatarum* and a few *Zygæna filipendulæ* were seen. A beautiful specimen of *Zonosoma omicronaria* was taken, and two *Melanippe procellata* were

knocked out of the clematis at the foot of the chalk hills. *Eubolia bipunctaria* was in countless hundreds on the chalk slopes, and *E. mensuraria* was common in the sheltered hollows. *Uropteryx sambucaria*, *Metrocampa margaritaria*, *Acidalia aversata*, *A. osseata*, *A. trigeminata*, *Cabera pusaria*, *Larentia didymata* (very abundant). *Hypsipetes elutata* (swarming), &c., were also beaten out. In the hope of breeding some of the *Dianthæciæ*, I picked a bagful of campion capsules, and found a few larvæ of *Eupithecia venosata* among them. Dusking produced swarms of *Larentia didymata*, which were flying over the bilberry; *Acidalia imitaria*, *A. aversata*, *Leucania lithargyria*, *Xylophasia lithoxylea*, and *Botys ruralis*; whilst single examples of *Apamea ophiogramma*, *Acidalia imitaria*, and *Botys farinalis* came indoors to light. *Bryophila perla* was found on walls in Dorking.

My next excursion was to Horsley, with Mr. S. W. Kemp. Several rather worn *Argynnis aglaia* were seen, and one *A. adippe*. *Pieris brassicæ*, *P. rapæ*, *P. napi*, *Epinephale ianira*, *E. hyperanthus* (worn) *Cænonympha pamphilus*, *Lycæna corydon* (very abundant), *L. icarus*, *Polyommatus phlæas*, *Hesperia sylvanus*, *H. thaumas*, and a few very fresh *H. comma* complete the list of butterflies. Very few moths were seen: *Macroglossa stellatarum*, *Porthesia similis*, *Drepana unguicula*, *Bryophila perla*, *Plusia gamma*, *Toxocampa pastinum* (one), *Phytometra ænea* (worn), *Acidalia aversata*, *Eubolia bipunctaria* and *E. mensuraria* (both very abundant) were the only species. The day was spoilt by a heavy thunderstorm.

August 1st was spent at Byfleet, with Mr. H. J. Turner and my father. Here, again, we were fairly drenched, but the rain ceased about 1.30, and did not begin again till six. A single male *Gonepteryx rhamni* and five other more or less common species of butterflies were seen. *Lithosia griseola* was common alongside the canal, and three specimens of var. *stramineola* were boxed, and another seen. *Porthesia similis*, *Uropteryx sambucaria*, *Zonosoma punctaria* (common and fresh), *Z. porata*, *Z. pendularia*, *Eupisteria heparata*, *Cabera pusaria*, *Lomaspilis marginata*, *Acidalia emarginata*, *Eubolia mensuraria*, *E. palumbaria*, *Fidonia atomaria*, *Ennomos angularia*, *Botys ruralis*, *Ebulea crocealis*, and *Hydrocampa nympheata* were also noticed. The following larvæ were taken, among others: *Gonepteryx rhamni*, *Notodonta dromedarius*, *Spilosoma mendica*, and *Acronycta leporina* (two from alder and one from birch). The wet weather was too much for the dragonflies, and the following species only were noticed: *Erythromma najas*, *Ischnura elegans* (very abundant), *Platynemis pennipes*, and *Enallagma cyathigerum*.

August 14th, at West Wickham, produced *Hepialus hectus* (one), *Calymnia trapezina* (common), *Plusia gamma* (swarming), *Ennomos erosaria* (?), *Timandra amataria*, *Pelurga comitata*, *Zonosoma punctaria*, *Z. porata*, *Botys ruralis*, and *Endotricha flammealis*.

August 16th, a very enjoyable day was spent with Mr. F. Enock at Ockham Pond and Wisley Lake, mainly for Odonata. The following species were noticed:—*Sympetrum scoticum* (very common), *S. sanguineum* (a few), *S. striolatum* (very common), *Æschna grandis* (common, but difficult to catch), *A. cyanea* (?), *Lestes sponsa*, *Ischnura vlegans*, and *Enallagma cyathigerum*. Lepidoptera noticed were:—*Vanessa cardui*, *Gonepteryx rhamni*, the common Pierids, *Epinephale ianira*, *E. tithonus*, *Pararge megæra*, *Cænonympha pamphilus*, *Lycæna icarus*, *L. argiolus*, *Polyommatus phlæas*, *Plusia gamma*, and *Hydræcia nictitans*, and larvæ of

Smerinthus ocellatus, *Drepana falcatoria*, and *Gonoptera libatrix* (also a pupa spun up in some sallow leaves).

My father and I spent August 22nd at Loughton, taking, among other things, *Thecla betulæ* (a perfectly fresh male), *Ennomos angularia*, *E. tiliaria*, *Hydrocampa nympheata*, and *Paraponyx stratiolata*. Larvæ of *Orgyia pudibunda* and *Demas coryli* (two) were beaten from beech. Among the dragonflies *Æschna grandis* was common, and so were some greenish *Æschnas*, whose species it was impossible to tell on the wing. One *Æschna mixta* was taken. *Sympetrum striolatum* was common, and *Ischnura elegans* and *Enallagma cyathigerum* were also noticed.

The evening of the same day was spent at Bexley, where treacle produced *Miana furuncula*, *Xylophasia polyodon*, *Mamestra brassicæ* (very common), *Agrotis suffusa*, *A. puta*, *Noctua xanthographa* (common), *N. c-nigrum*, *N. stigmatica*, *N. baia* (worn), *Triphæna pronuba* (very common), *T. orbona*, *Amphipyra pyramidea* (worn), *A. tragopogonis*, *Hadena chenopodii*, *Phlogophora meticulosa*, *Cosmia trapezina*, *C. diffinis* (one, quite fresh), *Catocala nupta*, *Endotricha flammealis* (v. worn), and *Pylalis costalis*; whilst ragwort only attracted *Noctua xanthographa*, *N. stigmatica*, *Camptogramma bilineata*, and *Botys ruralis*.

August 31st was spent at Chelsfield and Shoreham, Kent. *Gonopteryx rhamni* was abundant. Only one *Colias edusa* was seen, but seven *C. hyale*. *Vanessa atalanta*, *V. io*, *V. urticæ* (abundant), *Epinephele ianira* (abundant), *Cænonympha pamphilus*, *Satyrus semele*, *Lycæna icarus*, *L. argiolus*, and one *Hesperia comma* were seen. *Hypena rostralis* was abundant; and, among other things, *Minoa euphorbiata*, *Acidalia inornata*, and *Anaitis plagiata* were taken. The specimen of *M. euphorbiata* was netted in the same place where we took the species in 1898. About eight small larvæ of *Acronycta ligustri* were beaten from ash. They fed up well on privet.

On September 7th a day's collecting was enjoyed with a friend at Birchington-on-Sea. We succeeded in taking fifteen *Colias hyale* between us, and saw many more. Only one *C. edusa* was seen. I may mention that, among other common butterflies, *Pieris rapæ* simply swarmed; one of the clover fields seemed alive with them. A fresh brood of *Strenia clathrata* was coming out, and, among other things, *Aspilates citraria*, *Hydrocampa nympheata*, and *Cataclysta lemnata* were taken. Very little attention was given to the Odonata, as the primary object was *C. hyale*. *Sympetrum striolatum*, *Ischnura elegans*, and *Lestes sponsa* were noticed.

Treacling at Paul's Cray Common, on September 10th, produced *Mamestra brassicæ* (common), *Amphipyra pyramidea* (common), *Phlogophora meticulosa*, *Catocala nupta*, *Hadena protea*, *Anchocelis litura*, and *Xanthia ferruginea*.

September 11th, at Brasted, practically wound up the season, as far as I was concerned. *Cidaria immanata*, *Xanthia cerago*, and a battered *Colias hyale* were the only species worth mentioning.

On the whole, I think that many will look back on the year 1900 with pleasant memories of its productiveness, and I am sure I shall be one of the number.—F. M. B. CARR; 46, Handen Road, Lee, S.E., November 18th, 1900.

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BIOLOGIC NOTES ON SOME CEYLONESE RHYNCHOTA. No. 1.

By E. E. GREEN, F.E.S.

AMORGIUS INDICUS (Lep. & Serv.) [=BELOSTOMA, olim.]

This huge waterbug is frequently captured in Kandy beneath the electric lamps which have been recently erected in the streets. They probably fly from the lake in the centre of the town. I have had several living specimens brought to me, and have kept some of them in a large glass aquarium for several months. They are sluggish creatures, and remain during the daytime with the tip of the tail projecting above the surface of the water, seldom moving, unless disturbed. I placed some small fish and tadpoles in the aquarium with them. I could never see any attempt on the part of the bugs to capture either of these animals. The fish have remained unhurt, but the tadpoles have disappeared one by one, seized probably during the night, when the bugs are more active. I do not think that *Amorgius* is quick enough in its movements to prey regularly upon fish, though doubtless weakly individuals would fall easy victims. I am of opinion that the natural food of *Amorgius* is rather such large insects or small terrestrial animals as fall accidentally into the water. It will also greedily feed upon frogs, when it can catch them. I have on several occasions placed large horny beetles, such as *Oryctes*, in the water. These have been quickly seized while struggling on the surface. They are held by the powerful front legs of the bug, assisted by the second pair, and are turned over and over until a crevice is found into which the point of the rostrum can be inserted. After they are quite dead the insects are usually torn into pieces and every part of the body thoroughly probed. Large grasshoppers are also freely taken, but smaller insects are generally

ignored. A good-sized water-beetle (*Dytiscus* sp.) shared the aquarium for about a week before it fell a victim.

Every fresh example of *Amorgius* that I have examined has been infested by a peculiar elongate parasitic Acarid, which attaches itself in clusters to various parts of the body and limbs of its host.

On October 26th I observed two egg-clusters at the bottom of the aquarium, presumably deposited by the *Amorgius*. The smaller cluster contained nine eggs; the larger cluster over fifty.



AMORGIUS INDICUS.—Fig. 1. Egg-cluster, nat. size.
Fig. 2. Single egg $\times 4\frac{1}{2}$ diam.

They were somewhat in the form of a bunch of grapes (fig. 1), the eggs cohering together by some fibro-gelatinous matter, the clusters, unattached to any object, lying loosely on the earth at the bottom of the vessel. Each egg is pyriform, 5.50×3 mm., the larger end outwards, and slightly flattened on one side (fig. 2). They are of a pale greenish yellow colour, with alternate opaque and translucent lines radiating from the centre of the larger extremity, and extending about one-third the length of the egg, except on the flattened area. These eggs were removed to a smaller aquarium with growing plants, but became discoloured after a few days, and are apparently dead. Possibly they were unfertilized.* Another batch of eggs was deposited on the 6th November, which have been left to take their chance in the larger aquarium. To prevent the escape of the adult insects the vessel is covered with perforated zinc.

Since writing the above, I have detected one of the bugs in the act of feeding upon its own eggs. It was holding the egg-cluster in its front legs and probing the separate eggs, one after another.

DISPHINCTUS FORMOSUS, Kirkaldy.

This species is, just now, abundant on plants of *Cuphea jorullensis* in the Botanic Gardens. The young shoots are badly punctured and wilted, and the plants completely disfigured, the damage being done chiefly by the immature insects. The adults

* For an account of the ova of the allied American *Benacus grisea* (Say) and *Amorgius impressa* (Haldem.) [= *americana*, auctt.] see C. M. Weed in Bull. Ohio, Agricult. Exper. Sta., Technic. Series, vol. i. pp. 14-17, Pl. ii. figs. 6 and 7 (1889).—G. W. K.

are difficult to find and, being very active on the wing, make their escape as soon as the plant is disturbed. I was fortunate in capturing one pair *in coitu*, and confined them in a glass jar with some young shoots of the plant. A few days later I found several eggs embedded in the fleshy stalks. They are deposited singly, the body of the egg completely concealed (fig. 4), the



DISPHINCTUS FORMOSUS, Kirkaldy.—Fig. 3. Egg in section $\times 20$ diam.
Fig. 4, showing part of egg exposed.

position marked—as with the eggs of *Helopeltis**—by a pair of delicate, glassy, horn-like processes. The complete egg (fig. 3) might easily be mistaken for that of *Helipeltis*, the principal difference being that the two processes are usually divergent instead of convergent. The longer process has a knee-like bend shortly above the base. The cap of the egg is delicately pitted. The body of the egg is smooth, curved, elongate, of a pale creamy white colour. Length, 1.50 mm. Breadth, 0.25 mm. Longer process, 0.50 mm. Shorter process, 0.20 mm.

ANOPLOCNEMIS PHASIANUS (Fabr.).

Both the adult and immature insects occur frequently on the young shoots of *Erythrina lithosperma*. They puncture the extremities of the shoots, causing them to wilt and wither. I noticed, one day, an adult male apparently feeding, and approached it to observe the *modus operandi*. The bug, however, resented the intrusion, and ejected a jet of fluid backwards to a distance of fully eighteen inches. The jet appeared to proceed “*ab ano*.”

N.B.—Mr. Albert D. Michael has kindly examined the parasites mentioned above as being found on *Amorgius indica*, and determines them provisionally as larvæ of *Hydrachna belostomæ*, Riley (adult *Hydrachnæ* are not parasitic). In reply to my note, pointing out that the American *Amorgius* is a different species from the Sinhalese one, and asking whether the parasite of the former is actually conspecific

* Compare Dudgeon's account of the oviposition of *Helopeltis theivora*, Waterh. and *Disphinctus dudgeoni*, Kirkaldy (1894, Ind. Mus. Notes iii. (5), pp. 33–8; 3 figs.); also Sharp, 1899, Cambridge Nat. Hist. vi. pp. 561–2 (Sharp incorrectly cites “Dudgeon, p. 53”).—G. W. K.

with that of the latter, Mr. Michael writes me: "Riley was not an acarologist, and his descriptions and drawings of Acari cannot ever be relied on for small differences between closely allied species. Your specimens naturally had not any adult *Hydrachnæ* on it, but so far as I could judge from Riley's drawings and very imperfect descriptions of the larva, it seems to agree well in all its stages with your specimens. The water-mites, when parasitic, do not usually confine themselves to a single host, but are often found on several species; and the geographical distribution of Acari is usually very wide, often astonishingly so. Riley says that his species is particularly common on *Zaitha fluminea* (Say)* = *Perthostoma aurantiaca*, Leidy" (in litt. 29 Jan. 1901).

G. W. K.

MISCELLANEA RHYNCHOTARIA.

By G. W. KIRKALDY, F.E.S.

Fam. *Miridæ*.

AUSTROCAPSUS, gen. nov.

Belonging to *Capsaria*, Reut., and allied to *Hyalopeplus*, Stål.

Head subtriangular, wider with eyes than the anterior margin of pronotum; tylus broad, declivous; interior margin of eyes sub-sinuately convex; first segment of antennæ stout, its length equalling that of the median line of the head from base of the head to base of tylus. Pronotum distinctly collared, the collar anteriorly straight, posteriorly somewhat deeply (comparatively) convex. Pronotum raised posteriorly, anteriorly callous on each side behind the collar, very rugose transversely, widely somewhat sinuately rounded posteriorly, lateral margins subsinuate. Scutellum transversely impressed near the base. Interior cell of membrane very large.

The other characters are those of the division as signalized by Reuter in the fifth volume of the 'Hemiptera Gymnocerata Europæ.'

Type A. [†]MARTIGENA, sp. nov.

Head yellowish; two thin median longitudinal lines from which branch off obliquely six or seven lines on each side, first segment of antennæ blood-red; eyes dark blood-red. Pronotum and scutellum yellowish, very closely rugose and marked with blood-red. Elytra (including membranal nervures), abdomen above, and beneath, blood-red. Wings and membrane infusate. Head beneath, sterna and femora yellowish with bright blood-red subparallel sinuate lines.

Though the ground colour is really yellowish, it is so closely marked with blood-red that the general effect is that of the latter colour. The pubescence is scanty, and is pale golden yellow. Length 6½ mill.

WEST AUSTRALIA, Perth (my collection).

* Now known as *Belostoma fluminea*, Say.

* Fam. *Gerridæ*.2. *GERRIS ANADYOMENE*, sp. nov.

Belongs to subgenus *Limnometra*, Mayr.

Flavous; head with an irregular diamond and two lateral stripes, pronotum with a median and two sublateral lines, irregular markings on ambulacra, &c., black. Elytra dark greyish fulvous; nervures fulvous, apically, darker. Spines of seventh segment extending beyond apex of abdomen, elytra extending far beyond apex of abdomen. Male: seventh segment deeply, roundly emarginate ventrally. Long. to apex of elytra 14 mill.

CEYLON, Pundaluoya. Collns. E. E. Green and Kirkaldy.

Larger and stouter than *minuta* (Mayr.), to which it is somewhat allied.

3. *GERRIS SAKUNTALA*, sp. n.

Belongs to subgenus *Limnometra*, Mayr.

Black, closely set with pale golden pubescence; a central line on head and anterior lobe of pronotum, lateral margins of posterior lobe, antennæ, legs. &c., fulvous. Elytra infusate, nervures pale golden, pubescent. Venter pale flavous, Elytra extending far beyond apex of abdomen. Long. 5½ mill.

CEYLON, Pundaluoya (collns. E. E. Green and Kirkaldy).

This lovely little *Gerris* is quite distinct in colouring from any other *Limnometra*, and is specially distinguished by the entire absence of any connexival spines.

THE STUDY OF LIFE-HISTORY.

(Concluded from p. 97.)

In studying the habits of living insects instead of too closely confining our observations to captive specimens, we should, when practicable, contrive to give at the same time constant attention to the same species existing in a state of nature; for the circumstance must never be overlooked, that it matters not how cunningly we may endeavour to conceal the fact, nor how diligently we may attend to food supply and other details, our types are nevertheless living under purely artificial conditions. Captive insects will teach us much, and will more often than not prove the source from whence most of our information is gleaned, but we should still regard them more in the light of qualified teachers or guides whose principal usefulness lies in the furnishing us with valuable hints and data upon which to base and work out our study of their species in the open, rather than as the sole origin from which our knowledge is to be derived. It is in all probability

* These species will be treated more fully and figured in another place.

the neglect of this combination of observation which has contributed in no small degree to some of the curious errors so often met with in accounts of the life-histories of even our commonest insects; such as, for instance, in the egg-laying of the Dytisci, a genus of carnivorous water beetles, where, in many text-books, you will find it definitely stated that the female extrudes her eggs at random in the water. This assertion was founded in the first place on the experience of Lyonnet, whose captive beetles thus oviposited, as pent-up insects are wont to do; whereas under natural conditions the eggs in this genus are really deposited singly and with circumspection in the submerged portions of various rushes, pond-weed, and other aquatic plants, and for the careful placing of which the ovipositors of the females are provided with two sharply-edged plates, one on either side of the oviduct, with which incisions are made in the submersed stems to receive them. This tendency to promiscuous oviposition during captivity I have often noted in connection with *Dytiscus punctulatus*, *Gastroidea viridulus*, and other insects.

Whilst speaking of the Dytisci, I will here call attention to one or two of the simpler problems awaiting solution, to which I just now alluded. Those of us who have kept *Dytiscus punctulatus* or *D. marginalis* alive for any length of time will have become cognisant of the fact that, in common with many other imagines and some few larvæ, they stridulate at times with great energy. This stridulation is produced in two distinct tones—the one harsh and shrill, the other a lower “trill” or buzzing sound. We shall moreover have probably remarked that such notes are almost invariably emitted towards nightfall or during the evening hours, and I am strongly inclined to the opinion that the Dytisci, like the Gyrini, or “whirligig” beetles, are in the habit of stridulating previous to flight; for, in so far as my own experience goes, these musical efforts are confined to the evening, during which period, too, the beetles fly. But the question to which I particularly wish to direct your attention is, by what mode are these sounds generated? The only definite statement I can find on the subject is by Prof. Miall, who says “the sound is produced by rubbing the under side of the wing-cases against the ends of the body”; but if these areas are examined stridulating organs are not readily perceptible. The fact that Mr. C. J. Gahan made no reference to the Dytisci in his exhaustive paper “On the Stridulating Organs in the Coleoptera,” read before the Entomological Society of London during the session just closed, prompted me to write him on the subject, with the result that he tells me he has never been able to detect the presence of stridulating organs in the genus. “Whether they make the sound in the manner described by Prof. Miall or not,” he proceeds, “I cannot, of course, say, but I am inclined to doubt his statement. There is nothing on the elytra or abdomen at all resembling the stridu-

lating areas of other beetles, nor is there on any other part of the body, so far as I could find. Since receiving your letter I have again examined a *Dytiscus* I had by me, but I have not been more successful than before. There is a series of short transverse ridges near the edge of the upper surface of the first abdominal segment in *Dytiscus*, but the ridges are very coarse, unlike any occurring on true stridulating areas of other beetles, and, so far as I can see, it is not possible for them to come into play against the elytra." I might add that Dr. Sharp, our greatest authority on the carnivorous water-beetles (*Dytiscidæ*), makes no mention of stridulating organs other than those of *Pelobius* (Camb. Nat. Hist.).

Since writing the above Mr. Gahan has been kind enough to again communicate with me on the matter, calling my attention to a paper entitled "Die Tonapparate der *Dytiscidæ*," by Hermann Reeker ('Archiv für Naturgeschichte,' 1891, vol. lvii. pp. 105, *et seq.*), in which he states that stridulation is produced in *Dytiscus*, *Pelobius*, and other members of the family by rubbing one of the large outer wing nervures against the elytra, the transverse ridges on these nervures being very prominent, and, according to Reeker, more numerous in the *Dytiscidæ* than in other beetles. But "many other beetles," writes Mr. Gahan, "which are not known to stridulate, or else are well known to do so in a different way, have the corresponding wing-nervure just as prominent and as strongly ribbed across; so that I am somewhat inclined to share Dr. Sharp's view that Reeker's explanation is erroneous. I certainly believe with Sharp that it is erroneous so far as it applies to *Pelobius*, but he may, of course, be right in regard to *Dytiscus*; and it would be well therefore to call attention to his explanation."

Here then is one of the enigmas awaiting solution by the diligent naturalist, and any young member here present who may be anxious to solve the mystery will meet with very little trouble in obtaining his beetles, have little time to wait ere hearing them stridulate, and experience little difficulty in obtaining permission to communicate in the form of a paper at an early meeting of the Society the successful results of his investigations.

Still confining ourselves to the same insect, we may further note that no satisfactory explanation has hitherto been advanced to account for the dimorphism exhibited by the females of this genus. Of our six British beetles, the females are dimorphic in four species. Camerano, probably quoting from Simmermacher, says that the sculptured females belong more particularly to northern districts; and the observations of Redtenbacher, who states that near Vienna the smooth form of female is as general as the rough, appears to support this assertion. But the fact, even if established, fails to furnish us with any clue as to either cause or purpose. In the allied terrestrial family of *Carabidæ*

the males as well as the females are usually rough, an event of rare occurrence in the *Dytiscidæ*; whilst in *Hyderodes*, the closely allied genus which combines with *Dytiscus* to constitute the tribe *Dytiscina*, the females, although dimorphous, have almost invariably smooth elytra like the males. Early authors have generally associated the roughness of the females with the perpetuation of the species, and regarded the grooved elytra in *Dytiscus* as a special provision of Providence, and accessory to the suckers on the fore feet of the male beetles. But Plateau was the first of several naturalists whose experiments greatly tended to shake our faith in these earlier interpretations. The results of Plateau's investigations have been summarized by Miall, whilst the subsequent tests of Dr. Lowne formed the subject of a paper communicated to the Royal Microscopical Society in 1871. It will be sufficient for our purpose to-night to quote the former:—“(1) Furrows on the elytra diminish instead of increasing the holding power of suckers; ground glass and paper do not on trial act so well as polished glass. (2) The suckers of the male are not applied to the furrowed part of the elytra at all, but to the prothorax and the smooth edges of the elytra. (3) Females with smooth elytra occur now and then in England, and the male can hold these as well as the common form.”

The subject of dimorphism has, since the publication of Darwin's 'Origin of Species,' received a good deal of attention, more especially from botanists and lepidopterists. Sexual dimorphism is shown in some degree by a large portion of our British Lepidoptera, especially amongst the blue and hairstreak butterflies; and two forms of the same sex, as in *Dytiscus*, are not uncommon: thus in the clouded yellow (*Colias edusa*) one form of the female resembles the male, save that the broad dark border which runs round the wings in the latter sex is broken by yellow spots, whilst the other is of a more or less unicolorous creamy-yellow tint. Again, in the silver-washed fritillary (*Dryas paphia*), the female may be either dark brown or blackish green. Whether Mr. Tutt, Mr. Pierce, or other authority has successfully solved the reason for these persistent variations in the same sex amongst lepidopterous females, I am, I regret to say, insufficiently acquainted with that order of insects to state; but no convincing or satisfactory explanation has hitherto been advanced to account for the dimorphous females in *Dytiscus*, and I have therefore pleasure in further calling the attention of some of our more enthusiastic members to this interesting fact.

It is a far cry from the rotund and solidly constructed *Dytiscus* to the fragile form of *Chironomus plumosus*, the earlier life of which dipteron furnishes those of us who have microscopes with opportunity for very careful observation and minute research, for the problem here set us falls to the province of those who combine with the study of the living insect, pure and

simple, the allied interesting microscopic examination of its parts. Although perhaps unfamiliar by name, several species of *Chironomus* will be known to us by sight, the insects being often common about our window-panes within doors, or seen performing intricate gyrations in the air without. In appearance they closely resemble gnats, or mosquitoes as they are often called, the similitude being so marked that there is every excuse for our at first confounding the two. A rough and ready way of distinguishing between them is to watch the insects at rest, when it will be seen that in *Chironomus* the front legs are raised, and in the gnats the hinder ones. A closer examination of the two insects will show that the *Chironomus* differs very materially from *Anopheles*, *Culex*, and other of the true gnats in having the mouth-parts unadapted for either piercing or suction; and, from the fact also that the stomach is almost invariably empty, it is conjectured that, in common with many other insects, the *Chironomus* does not feed in the imago state. It is not my intention to enter into the life-history of these interesting insects, for details of which it will be sufficient to refer the student to Miall's recently published works on the subject. Suffice it to say that the females lay their eggs in running water, on the top of which they rest, the ova requiring continuous access to the atmosphere. To prevent them being carried down by the current, and possibly submerged or otherwise destroyed, they are, instead of being permitted to float free, deposited in long rope-like chains, one end of which is firmly attached to the bank or other suitable moorings, the string of eggs thus riding easily at anchor on the surface of the stream. These egg-ropes, which can usually be procured throughout the summer, will prove of deep interest to the young entomological microscopist, for, being of great transparency, it is possible to examine them as living objects, and this, too, without preparation of any kind; so that after examination they can be replaced in the water to continue their development, the whole of which process occupies less than a week. In from three to six days, according to temperature, are hatched little red larvæ, which, when full grown, attain to as much as an inch in length. Their crimson colour has gained for them the popular name of "bloodworms." These, too, are transparent, and furnish most excellent material for the biologist, since the heart, nervous system, and other internal arrangements are easily examined through the clear outer body-wall. But it is in the region of the nuclei of the cells which line the salivary glands that our physiological problem in this species lies. These nuclei will be found to be large, and, in addition to enclosing one or two nucleoli, or smaller spheres, contain a peculiar elongate irregularly-coiled cord, the ends of which, when two nucleoli are present, are joined to both; but should one nucleolus only be enclosed, then it receives the two ends (Miall). What are the

functions of this intricate cord-like structure? What part does it play in the economy of the insect's life? Balbiani (1881) has given us much information respecting the salivary cells and nuclei of the *Chironomus* larva, to whose exhaustive remarks Miall (1895) has added some important observations; but so far no entomological biologist has been able to throw any light upon the very peculiar cords to which I have ventured to direct your attention.

There is another gnat-like fly (*Corethra plumicornis*) which deposits her eggs in a flat mass on the surface of still and shaded pools. From these emerge long slender transparent creatures that, from their peculiar habit of suddenly disappearing by rapidly changing their position, have not inaptly been designated "phantom larvæ." They are highly predaceous, and somewhat smaller than the bloodworms. Limbs are absent, unless a hooked foot-like protuberance at the tail-end can be described as such; but the antennæ being prehensile, the larva makes good use of these in the capture of its prey, which consists for the most part of small aquatic organisms of various kinds. But the curious part about the phantom larvæ is that, although requiring air for breathing purposes, it possesses no spiracles. Is respiration carried on through the body-wall? For, notwithstanding the apparent total absence of external orifices, there is nevertheless a partially developed tracheal system consisting of two tubes running longitudinally through the insect, which, although devoid of air throughout their greater length, dilate into large well-filled air-sacs towards either extremity of the body. Prof. Miall has discovered that in newly-hatched larvæ neither the tubes nor sacs contain any air whatever, and, although a good deal of attention has been devoted to the subject, we are not yet in possession of any facts to lead us to the knowledge as to how air is first admitted to the air-chambers, or subsequently renewed. Is gas generated by the larva itself in a similar way to that by which some fishes are known to inflate their swimming-bladders, and some zoophytes their floats? Bohr and Moreau have given much attention to this latter subject, and the former has shown us that the air-bladder of a fish completely refills after puncture, the gas generated containing as much as 80 per cent. of oxygen. Does the minute larva of *Corethra* employ similar methods to the nautilus, or how is its air evolved? This is yet another of Nature's unsolved mysteries, the satisfactory unravelment of which would probably help us very considerably to understand the fact of the possession of highly oxydised air by many other aquatic animals.

Such, then, are a few of the legion of pertinent questions which ever confront the biological investigator—problems that the entomological student will constantly meet with on every hand. I might allude to many puzzling circumstances in the

life-histories of the earwig, grasshopper, and other well-known insects; but by thus unduly extending my address I should run serious risk of destroying the only merit it stands possessed of, and the only claim it has upon your indulgence to-night, *viz.* its brevity.

I will in conclusion therefore confine myself to the suggestion that there should be more intercommunication and combination, for dealing with matters of general concern to all, between the various Natural History Societies throughout the length and breadth of the land than exists at the present day. Any member who is possessed of sufficient curiosity to fill in, say in two colours, on an ordinary Bradshaw railway map, the various districts covered by members of the different Entomological Societies and Natural History Field Clubs will in all probability find they extend to far greater number and wider distribution than he ever supposed; whilst a cursory glance through the pages of the 'Naturalists' Directory' will disclose the fact that in our ranks are also included many persons of influence. Were, then, some measure of intercourse and mutual support obtaining, it would enable us to devote attention to two important questions, one of vital interest to ourselves, and the other to the community at large. With regard to the first of these—*viz.* that scientific societies in their several districts should either by concerted or other action assist in the endeavour to prevent the enclosing of common land and ground in the possession of the Crown—I have been somewhat anticipated by the very apposite remarks of Dr. Cotton with regard to Delamere Forest, and therefore now only briefly allude to the subject for the purpose of adding one or two additional facts, which it may interest the Society to know. We have it on the authority of Mr. Fortescue Horner, one of H.M. present Commissioners for Woods, Forests, and Land Revenues, that five and forty years ago the woodlands of Delamere extended to nearly 4000 acres, since which time 1800 have been cleared for agriculture and 126 sold. At that period 750 acres of reclaimed land were already let out as farms, a total which at the present day has grown to 2550; so that from 1856 to the end of the century just closed, the woodlands appear to have shrunk from nearly 4000 acres to but little more than half their former dimensions. I am neither a prophet nor a mathematician, and will therefore refrain from prognostications as to the future other than to express the opinion that unless definite action is shortly taken to prevent further encroachments, Delamere will, in the course of a few decades, be a forest only in name. Scientists in the South of England have done much to stop the reclamation of land which formerly obtained in the New Forest, and we ought in no way to lag behind in our endeavour to save the whole of that part of Delamere which now remains for the benefit of future generations of naturalists.

In passing, and as also bearing on this subject of mutual support, I may add that I think we should, as an independent organization, endorse the action taken by the Liverpool Biological Society a few days since in its endeavours to obtain a more thorough recognition of our local fauna in the approaching rearrangement of the City Museum. With regard to our own branch of natural history, the collection of insects in the past can scarcely be said to have been in any way up to date, either as representative of the district, or in the matter of classification and nomenclature; and the time would appear opportune, in view of the additional appointments which at no distant date will have to be made, for us as the recognised Entomological Society of this part of South-west Lancashire to express the hope that the Museums Committee may find it possible to add an entomological expert to the already hard-worked staff of the distinguished Director of our City Museums.

With regard to the second question, one cannot help feeling that much good work is done by entomologists which is never heard of outside the narrow confines of their several districts, and except during seasons of abnormal appearance of certain rarities, such as *Ægialia rufa*, *Colias hyale*, *Deilephila galii*, &c., we hear nought of the locality to which they belong. Can it be that during the intervening years nothing of general interest has been learnt; nothing observed which might prove of ultimate value? I cannot think this, but I *do* think that, owing to the "splendid isolation" from which scientific societies, like our great daily newspapers, sometimes affect to ignore one another's existence, much important knowledge on lesser rarities is irretrievably lost. And, after all, it is with the *less* rare insects that our country generally is most vitally concerned—pests like the turnip beetle (*Phyllotreta nemorum*, *P. undulata*, &c), magpie and codlin moths (*Abraxas grossulariata* and *Carpocapsa pomonella*), daddy longlegs (*Tipula oleracea*, *T. maculosa*), &c. Would it not be possible for every natural history society, in addition to the important local work in which they are now mostly engaged, to contribute yearly valuable information on many economic questions of general importance to the community, by forming a small committee to receive and arrange the observations of its members on their experiences during the year of any abnormal variation in abundance of some of the commoner and more injurious insects in their several branches of entomology, as well as to tabulate any remarks they might make on the subject? Any inquiry into the question of such variation prevailing during a sequence of years would be of course of an exceedingly intricate and complex nature; and as it is probable that weather, and especially temperature—as distinct from climate—acting either directly at some critical epoch in the insect's life, or indirectly through food-plants, &c., would be largely responsible for many

of the phenomena noted, it would be the duty of the committee to add also a concise epitome of any special *local* feature in the type of weather experienced over the district from which the observations had been gleaned. All meteorological conditions of a general character could be obtained from the records of the Royal Meteorological Society's one hundred climatological stations established in various parts of the kingdom, and these would of course be available to the specially appointed Central Committee, to which at the end of each season every society would forward its report for arrangement and comparison.

The value of such records might not at first be very apparent, although they would early serve to show us whether the appearance of any insect pest was of a general or only local nature, and, if the latter, the Central Committee would pay particular attention to the reports received from the stricken districts with the object of discovering any possible reason for such occurrence. In the course of a decade or two a mass of carefully arranged observations and details from all parts of the kingdom would be in the possession of this committee, from which it is certain many important facts would have already begun to manifest themselves, and every year would naturally add to the value of the records by furnishing us with increasing data upon which both to base our theories and determine our facts.

That the rough scheme here sketched may appear difficult of attainment in the crude and skeleton form in which I have presented it, there is no one more sensible than myself. Nevertheless I do not regard the subject as chimerical, nor as one more fitted to the columns of 'Punch' than inclusion in the transactions of a scientific society. Our grandfathers would have been sceptical of the possibility of obtaining from a central bureau in London daily forecasts of the weather for all parts of the kingdom, yet we are perfectly accustomed to the practice. But how many of *us* a year or two ago would have dreamed of the value shortly to be attached to the yearly reports of the irregular rainfall in India; whilst fewer still would have imagined that a large portion of humanity was soon to benefit by the accumulating records of so apparently uncommercial a proceeding as the study of the spectra of sun-spots. Yet observations of these two seemingly fortuitous events covering a sequence of years exhibit sufficient method and connection to warrant Sir Norman Lockyer's stating that one of the great scientific triumphs of the early years of the present century will be the ability not only to foretell approaching droughts in Australia and famines in Hindustan, but to add details as to area and extent. And who knows but that, just as the British farmer now scans in his morning paper the weather predictions for his district, so that farmer's grandson may in future years pay even greater attention to the monthly or other periodic forecasts of the Economic Entomologist's Depart-

ment of the Board of Agriculture—predictions of the probable occurrence of various insect pests that would be based on the relations that had been observed to exist between certain natural phenomena extending over a considerable number of years, which would render it possible to issue timely warning and advice of inestimable advantage to the agriculturist and incalculable value to the nation at large.

I trust then that the few disjointed remarks it has been my privilege to address to you this evening may serve to stimulate us to a more intense interest in the fascinating study of insect life, more especially with a view to the solution of such economic questions of importance to cultivators of the soil as that to which I have just alluded,—a study which, whilst providing us with every opportunity for pleasant recreation and interesting investigation ourselves, will afford us additional gratification by the knowledge that we are also contributing to relieve the anxiety, lighten the labour, and increase the prosperity of thousands of our fellow men.

NOTES AND OBSERVATIONS.

HECATERA SERENA LARVÆ NOT ON GOAT'S-BEARD.—Mr. L. B. Prout has kindly written to me about the supposed larvæ of *Hecatera serena* feeding in the flowers of goat's-beard near Chester (*ante*, p. 105). His interesting letter makes the supposition that the larvæ were *H. serena* so improbable, that, with his permission, I give his remarks upon the species in full. He says:—

“Unless the species has very different habits at Chester from the normal, I cannot conceive that you can have been ‘too late’ for the larva on June 18th, and half fancy your ‘informant’ must have been poking fun, and that it was something else which had hollowed out the flowers of goat's-beard. In all places where I have collected, the imago of *serena* is just in its prime in the latter half of June and beginning of July, and as the larva *follows* the imago in the same year (*i. e.* the species hibernates in pupa), June 18th seems an impossibly early date. Moreover, I doubt if you will find ‘goat's-beard’—by which I understand the common ‘Jack-go-to-bed-at-noon’ (*Tragopogon pratense*) of our meadows—its usual foot-plant. This goat's-beard, with its grass-like leaves, is in flower in June, which, as I have just said, is too early for my experience of *serena* larvæ. I used, misled by Newman, to search for it on ‘sow-thistles,’ but some notes by Dr. Riding and Mr. Fenn some years ago (*Ent. Rec.* ii. p. 290, iii. p. 84) raised doubts whether it ever fed naturally on these, and suggested that it should be sought on ‘hawk's-beard’ (*Crepis*). I immediately put this hint to the test—about July 20th, at Sandown—and beat three larvæ, half-size to nearly full grown, out of the very first batch of *Crepis* which I tried. The species, however, seems rather scarce at Sandown, and it was not till 1898, when I visited

Torquay, that I found the larvæ in abundance. Here, too, they were confined to the *Crepis*, though plenty of sow-thistle (*Hypochaeris*) and other Compositæ grew close at hand. The larvæ when young sit quite exposed by day on the flowers, and as soon as one has once 'got one's eye in' they are extremely easy to see—a green larva sitting stretched across a bright yellow flower. Of course, they are better protected when they sit curled round the calyx, but they are easily beaten off. They are full-fed about the beginning of August, or on till beyond the middle of that month. In confinement they will eat almost any composite flower, including our plebeian dandelion. Unfortunately, a large percentage are 'stung.'"

The following additional particulars I take from 'Wilson's Larvæ': Imago of *Hecatera serena*, June and July; larvæ, July and August; pupæ, September to May. What the caterpillars were which hollowed out the flower-heads of the goat's-beard it is difficult to say. But the matter will not be lost sight of. Wilson gives only two species of Lepidoptera as feeding on the flowers—*Calocampa exoleta*, the larvæ occurring from April to July, and *Amphipyra tragopogonis*, larvæ in May and June. *C. exoleta* is not a common insect with us, but, as *A. tragopogonis* certainly is, the larvæ were probably the latter species.—J. ARKLE; Chester.

MOths CARRIED OFF SUGAR BY SAND-HOPPERS (*TALITRUS LOCUSTA*).—At one time I used to sugar posts and pieces of drift-wood on the coast just above high-water mark for *Agrotis ripæ*, &c., but the patches of sugar were usually so densely covered with sand-hoppers there was scarcely any room left for moths, so I had to give it up and retire to where the posts and palings were further removed from the beach. On several occasions I have seen *A. ripæ* being carried off by one of these creatures, and once I rescued a very fine variety, which was quite uninjured, and making no attempt to escape from its captor.—GERVASE F. MATHEW; Dovercourt, March 14th, 1901.

RHIZOBIUS JUJUBÆ.—A supposed aphid is described under this name by Mr. G. B. Buckton in 'Indian Museum Notes,' 1899, p. 277, pl. xvii. It there appears as a new species, though I find *Rhizobius jujubæ*, Buckton, with a diagnosis, in Mon. Brit. Aphides, vol. iv. (1883), p. 181. The insect is found in India on the roots of *Zizyphus jujuba*, and is, to all appearances, judging from the description and figure, a coccid. It does not seem exactly to fit in any known genus, so it seems desirable to call attention to it, in order that those who have the opportunity may be led to determine its true affinities.*—T. D. A. COCKERELL; Jan. 16th, 1901.

MELITEA ATHALIA IN DEVON.—While taking *M. athalia* in Devonshire on June 13th, 1897, I captured a specimen of the var. *navarina*, very similar to that figured on p. 46 of Newman's Brit. Butt. (the first of his three lower figures), but with the orange spots on the

* It may be worth while to remark, that the name *Rhizobius*, Burm., for an aphid, conflicts with *Rhizobius*, Steph., applied to a coccinellid beetle. The latter was originally published as *Rhyzobius*, it appears, in 1835, the same year that saw the publication of the aphid genus. I have no means of ascertaining which has priority.—T. D. A. C.

borders of the posterior wings much more elongated.—R. S. MITFORD; 35, Redcliffe Square, South Kensington, March 4th, 1901.

THE COURTSHIP OF *ANTHOCHARIS CARDAMINES*.—Since the spring of 1899, there has been on my notes an observation which I have not ventured to publish because confirmation was wanting respecting the interpretation which I was inclined to give to the fact in question. In the present (March) number of the 'Entomologist' (p. 73) Mr. Guy A. K. Marshall has, however, independently arrived at a similar conclusion in the case of the South African *Pieridæ*, and it seems therefore desirable to place the observation upon record. At the period mentioned I noticed near Dunmow, in Essex, a male *C. cardamines* hovering round, and advancing towards and receding from, a female of this species sitting low down among the herbage with open wings and raised abdomen, precisely in the attitude described by Mr. Marshall. It seemed at first sight as though the male had been a successful suitor, and that pairing would take place. The female remained quite passive, and in no way repelled the advances of her suitor. For more than fifteen minutes the male continued his evolutions, and then, without being in the least disturbed by me, the insects parted company and flew away in different directions. I was much puzzled at the time to explain why, with no other rival in the field, and with an apparently passive female, the courtship should have ended in this apparently fruitless way. It afterwards occurred to me, on thinking the matter over, that the passivity and attitude might have been indications that mating had previously taken place, and that the new suitor had been warned off for this reason. This conclusion I now find to be completely in harmony with Mr. Marshall's wider experience. I do not know how long the male had been paying his attentions before his evolutions attracted my attention, but it was certainly more than fifteen minutes after my arrival before he realised that his suit was a useless one. This observation appears to me of interest also as indicating that in this species the male is the wooer, and this, from the point of view of the theory of sexual selection, is in accord with the fact that he is the more brilliantly coloured.—R. MELDOLA; 6, Brunswick Square, W.C., March 16th, 1901.

IRREGULARITY OF EMERGENCE, AND LARVAL RETARDATION.—Reading with interest Mr. Merrifield's notes on irregularity in emergence of the *Drepanidæ* (*ante*, p. 98), some similar observations made last year may be worth recording.

Plusia iota.—Sixteen larvæ of this species were successfully hybernated, during the winters of 1899 and 1900, amongst dead leaves of *Lamium album*, all having hatched on the same day the previous summer, and being of very similar size during hibernation. Feeding was resumed about February 18th, and all the larvæ but one began to spin their cocoons from April 23rd to 25th, the moths emerging from May 27th to June 4th.

The one exception, although perfectly healthy, appeared to cease growing almost entirely during April, whilst the others were rapidly maturing, but after the middle of May seemed bent on making up for lost time, being full-fed about June 6th, when it was unfortunately

allowed to escape, so that I have no note of the precise period of the retardation of emergence behind the others of the brood.

Pararge egeria.—Five ova were laid on July 3rd, the larvæ hatching on the 14th. The first pupation took place on August 11th, and that of two more a few days later. At this period the two remaining larvæ were less than half-grown, one pupating on September 19th, the other a day or two later. These two are now hibernating, apparently quite healthy, as pupæ; but the former three, after imaginal development had reached an advanced stage, dried up and failed to emerge, doubtless owing to unnaturally dry artificial conditions during a period of unusual heat.

Lycæna argiolus.—Ova from the first brood were laid on May 28th, the succeeding larvæ being full-fed about June 23rd. All but five of the ensuing pupæ emerged in due course on July 12th and subsequent few days; these five are now hibernating, and appear to be quite healthy. In contrast to this, it may be of interest to record that one pupa of some two dozen of the second brood, September, 1895, produced a female butterfly of a third brood, the same autumn, all the other pupæ waiting, in the usual course, until the following spring.

Lycæna alexis.—Ova laid June 18th, hatched 29th; larvæ developed well for a few weeks, feeding on young pods of *Lotus*; then all, with one accord, ceased growing or feeding entirely, although offered various other Leguminosæ, but remained about a quarter grown, and were alive, but still in this stage, in October last.

Anticlea badiata.—A number of larvæ from ova, fed up well and rapidly, last spring. On October 20th a female emerged, slightly undersized, but not otherwise different from those now appearing from the same brood (March 18th, 1901). These latter are all slightly over the average size.

Melanippe unangulata.—Ova laid July 10th, hatched 19th; had all gone to earth by August 14th. On the 25th of the same month a moth emerged, followed by eight more subsequently. These moths are all decidedly smaller than specimens taken at large at the usual time of flight. The greater number are still hibernating as pupæ.

Chrysophanus phleas.—Contrary to previous experience with this species, some two dozen, reared from ova last year, formed an example of simultaneous growth and development. Ova laid July 8th, hatched 17th and 18th; all the butterflies emerged between August 21st and 28th.

Colias edusa.—Considerable difference in rate of larval growth was observed with this species, but of a rather different significance than attaches to those mentioned above; inasmuch as delay seemed generally, though not always, to be the accompaniment of feeble vitality, such specimens that were much behind the others either producing diminutive specimens, or else failing to reach maturity.

In all the above instances, larvæ of each species were always confined in the same cage, suitable to their successive changes, and fed on the same leaves, the pupæ being also kept together; so that the unnatural uniformity of conditions in captivity serves to emphasize the importance that these irregularities must have to the species in nature, and can scarcely fail to be a powerful factor in the production

of those unaccountable "profusions" and "scarcities" of many species, which are so constantly recorded.—R. M. PRIDEAUX; Reigate, Surrey.

KNAGGS'S LEPIDOPTERIST'S GUIDE.—A third edition of this exceedingly useful work has just been published. We have not seen a copy, but understand that it contains many additional pages and illustrations, and although issued in cloth covers the price remains as heretofore, *i.e.* one shilling. The veteran will surely find the 'Guide' of service to him, whilst to the tyro it is simply indispensable.

INSECT FAUNA OF NOTTINGHAMSHIRE.—I am preparing for publication a list of the insects of this county, and shall be grateful for any information, list of captures, &c., from entomologists who have worked in the county.—J. W. CARR; University College, Nottingham.

ADDENDUM.—P. 37, insert: 1889.—On the Lepidoptera of Japan and Corea. Pt. iii. Noctues and Deltoides (Proc. Zool. Soc. Lond. 1889, pp. 474-571, pls. l.-liii.).

CAPTURES AND FIELD REPORTS.

COLIAS HYALE IN JUNE.—Looking through back numbers of the 'Entomologist,' and seeing the numerous records of captures of *C. hyale* during August and September of former years, I thought it might be interesting to mention that I caught an example in June, last summer, at Folkestone. I believe the date was June 16th, though it possibly might have been a day or two earlier or later. It was a poor specimen, but gave a most "sporting run." I have been told that it was probably a continental specimen. Is this so? I might also add that I caught a nice variety of *C. edusa* in Cornwall, in September. Its colour was between that of typical *C. edusa* and its white variety *helice*.—W. G. THEOBALD; Trinity College, Cambridge, March 3rd, 1901.

XYLOMIGES CONSPICILLARIS IN SOMERSETSHIRE.—I have to report this insect from the Taunton district. From dug pupæ a friend and myself have procured the following:—In 1899, three; in 1900, two; and this year two, up to the present time. On looking through the private collection of the late Curator of the Taunton Museum, I noted one specimen, which he told me he took about twenty years ago, on a gas-lamp. I see Newman mentions only three localities, and adds: "This insect is exceedingly rare in Great Britain." I shall be glad to know if this is still the case.—HARRIS DOIDGE; The Elms, Sherford, Taunton.

ORTHOPTERA FROM RENFREWSHIRE.—Mr. A. M. Stewart has sent me a specimen of *Gryllus domesticus*, and another of *Stenobothrus viridulus*, from Kilbarchan, together with a *Blatta australasiæ*, which last was obtained alive, in a fruiterer's shop in Paisley. It came out of a cluster of bananas from the Canary Islands, though of course it may have been taken on board previous to the vessel's arriving there.—W. J. LUCAS; Kingston-on-Thames.

CAMPTOGRAMMA FLUVIATA AT RHYL, FLINTSHIRE.—On Aug. 2nd, 1900, a small geometer came to window-light here; to establish its identity it was submitted to Mr. Barrett, who pronounced it to be "a beautiful female

fluviala." The markings on the wings are more distinct than those in Newman's illustration, the median bar being broken. I believe it to be the first of its species recorded for North Wales, and it is now in the Grosvenor Museum, Chester.—(Miss) A. STEELE PERKINS.

VITALITY OF HYBERNIA RUPICAPRARIA.—On Feb. 17th I found a specimen of *H. rupicaprarica*, on a pond covered with ice nearly an inch thick; I broke the ice, and put the piece containing the moth in a box; the insect must have been in, or on the ice about two days; there was quite a quarter of an inch of ice over the moth. When I got home I dissolved the ice, and found that the moth was quite perfect. I was surprised when I looked at it two hours later to find it alive.—T. L. HOWE; Beaufort House, Penarth, South Wales.

PHLOGOPHORA METICULOSA IN WINTER.—On Feb. 15th last I had a specimen of *P. meticulosa* brought to me by a lad, who found it on an oak-tree on Wimbledon Common. On March 23rd, last year, I took an example of this species at sallow. I also took a specimen on a fence in Richmond Park, Dec. 30th, 1899.—J. MILLER; 44, Longfield Street, Wandsworth, S.W.

A specimen of *Phlogophora meticulosa* was taken on palings on Dartford Heath, as early as March 3rd this year. My previous earliest record is March 31st, 1899, at sallow, in the New Forest.—I have taken the full-grown larva in January.—F. M. B. CARR; 46, Handen Road, Lee, S.E.

[See also Entom. xxxiii. 13.—ED.]

EARLY APPEARANCE OF PIERIS RAPÆ IN LONDON.—On March 21st, as I was walking down John Street, Adelphi, at 5.30 in the afternoon, something white fluttered down on to the pavement in front of me. I picked it up and found it to be a *P. rapæ*, evidently just fresh out. It probably came from the Embankment Gardens, which were not far off; but it is difficult to understand why it should have emerged on such a day, for there was then, and had been all day, a bitterly cold and very high wind from the north-east.—ARTHUR COTTAM; Eldercroft, Watford.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—*February 6th, 1901.*—The Rev. Canon Fowler, M.A., F.L.S., President, in the chair.—The President moved that an address of condolence and congratulation be presented by the Society to his Majesty King Edward VII. on his accession to the throne, and remarked that in 1833, when the Society was founded, her Majesty the late Queen, with her mother the Duchess of Kent, was the first to sign the book subscribed by members and fellows upon admission to the Society. The motion was seconded by Col. Swinhoe and carried unanimously.—Mr. E. B. G. Nevinson, of 3, Tedworth Square, Chelsea, was elected a Fellow of the Society.—The President announced that he had appointed as Vice-Presidents, Mr. C. G. Barrett, Mr. E. Saunders, and Mr. G. H. Verrall.—The President exhibited a specimen of *Colias edusa* var. *helice* with the margins of the wings entirely dark as in the male; also a variety of *Carterocephalus palamon* with the hind wings dark save for one conspicuous orange spot.—Dr. T. A. Chapman exhibited a large series of *Endrosæ* collected during

the last few years by himself, Mr. A. H. Jones, and especially by Mr. Tutt; *E. roscida*, which is a very distinct dwarf form, and from frequenting marshy flats must live on lichens growing in such localities, and not on stones as the others do; *E. irrorella*, which should be the rarest species in the Alps, judging by the comparatively few specimens met with; *E. aurita*, in very great variety, including a good many specimens that are called *kuhlweini* var. *alpestris*, none, however, reaching the type of *kuhlweini*, but sufficient to show with something approaching to certainty the question whether *kuhlweini* is simply an extreme form of *aurita*. *E. aurita* and *E. irrorella*, said Dr. Chapman, are very near together, no point in their anatomy being absolutely distinctive, while the genitalia are practically identical; *E. irrorella* always looks much slighter, being lighter scaled and the hairs short and smooth. It always has a yellow patch on the mesothorax. The venation is also distinctive, yet individuals of each species approach each other completely in each of the distinctive items of the venation, but never in all of them, so far as examination of a number of specimens goes. The specimens exhibited consisted of twenty-four *roscida* from two localities, twenty-two *irrorella* from eight localities, and two hundred and four *aurita* from twenty-three localities. Except *irrorella* from England, Finmark, and the Tyrol, and a few *aurita* from the Tyrol, all were from the Western Alps of Switzerland, Italy, and France. Examples from each locality when sufficiently numerous usually have a special facies. Some, as all those from Arolla, radiate; those from Bourg St. Maurice are without radiate forms; and so on. Some are more yellow; others deeper orange; some more mixed. Elevation tends to produce radiation, but no other general conclusion as to the effect of height, latitude, or longitude seems fully justified by the specimens.—Mr. C. G. Barrett exhibited, for Mr. G. O. Day, of Knutsford, a black variety of *Aplecta nebulosa*, Tr., with white cilia, and an asymmetrical female var. of *Fidonia atomaria*, Linn.—Mr. M. Jacoby exhibited a specimen of an unknown species of the Halticidæ.—Mrs. Nicholl exhibited a collection of Rhopalocera from the Lebanon district of Syria, and Mr. H. J. Elwes, on her behalf, read a paper explaining and illustrating the several species included. He said that Mrs. Nicholl's expedition had been both remarkable and successful. The lepidopterous fauna of this region was less known than that of other parts of Western Asia, and interesting inasmuch as the mountains of high Lebanon contained a larger proportion of Alpine species than might have been expected. Among other species Mr. Elwes drew special attention to *Thecla myrtale*, which, since it was described by Klug in 1832, has remained one of the least known members of the palæarctic fauna. No examples, it appears, had been taken in the interval until Mrs. Nicholl found it on the high mountains not uncommon in May and June. *I. asterope* was taken in some numbers on the coast, the species being the sole representative of its family between Syria and Manchuria. The Nymphalidæ also showed a great range of variation. Sir John Llewellyn, Bart., made some remarks on the character of the country through which Mrs. Nicholl had travelled, and, in reply to Mr. Jacoby, Mrs. Nicholl said that insects are not abundant generally, and the more productive spots are few and far between.—The following papers were communicated: "A revision

of the genus *Astathes*, Newm., and allied genera of Longicorn Coleoptera," by C. J. Gahan; and "A preliminary catalogue of the Lepidoptera-Heterocera of Trinidad," by W. J. Kaye. — H. ROWLAND-BROWN, *Hon. Sec.*

March 6th.—The Rev. Canon Fowler, M.A., F.L.S., President, in the chair. — Mr. E. W. Lane, of 9, Teesdale Street, Hackney Road, N.E., was elected a Fellow of the Society. — Mr. H. St. J. Donisthorpe exhibited a parasitic Braconid, bred from the galls of *Centhorrhynchus sulcicollis* on turnips, together with the host. — Mr. A. J. Chitty exhibited a variety of *Psylliodes cyanoptera*, Ill., the coloration of the thorax dark instead of the usual red, taken by him along with the typical form in August, 1892, at Wicken Fen, close to the Pumping Station. — Mr. H. J. Turner exhibited a long series of *Bryophila muralis* (*glandifera*) from Dawlish. The whole were either taken on, or bred from pupæ cut out of, a single roadside wall some hundred yards long, very lofty, and facing nearly north, on which aspect, however, it was protected by higher ground. They were obtained in mid-August, with the exception of a few which emerged at intervals during September and October, 1900. Generally speaking, the specimens were very dark, and the series was remarkable in that it contained but a few isolated examples of the forms which are prevalent in more eastern localities like Freshwater, Eastbourne, or Folkestone. The hind wings of all the specimens were dark, while, in the majority, the black markings of the fore wings were much intensified and increased in number, and a few specimens were largely suffused with black. A considerable number showed a dark rich green suffusion, while a large proportion were of a very deep yellow or olive colour with black markings. The yellow forms were perfectly natural, as a number emerged from the pupa exactly of that hue. Only a few showed any trace of the typical delicate dove-colour, and it was also noteworthy that the wings had a comparatively much greater area of black scaling than the eastern forms. — On the motion of Mr. H. J. Elwes, seconded by Mr. H. Goss, it was resolved that a Committee be appointed to consider the question of uniformity in nomenclature for the guidance of specialists contributing to the Victoria County Histories. — The following papers were read:—"Cetoniidæ collected by Messrs. H. E. Andrewes and T. R. D. Bell in the Bombay Presidency, with descriptions of the new species," by O. E. Janson; and "A Supplementary Catalogue of British Ichneumonidæ," by Claude Morley. — H. Goss and H. ROWLAND-BROWN, *Hon. Secs.*

SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—January 10th, 1901. *Annual General Meeting.*—Mr. W. J. Lucas, B.A., F.E.S., President, in the chair. — The Report of the Council, showing the work of the Society, was read, and the balance-sheet was adopted. The following list of Officers and Council were declared elected for the ensuing year:—President, H. S. Fremlin, M.R.C.S., F.E.S.; Vice-Presidents, F. Noad Clark, and W. J. Lucas, B.A., F.E.S.; Treasurer, T. W. Hall, F.E.S.; Librarian, H. S. Sauzé; Curator, W. West (Greenwich); Hon. Secretaries, Stanley Edwards, F.L.S., F.E.S., and Hy. J. Turner, F.E.S.; Council, R. Adkin, F.E.S., W. J. Ashdown, T. A. Chapman, M.D., F.E.S.; A. Harrison, F.L.S., F.E.S.;

A. M. Montgomery; E. Step, F.L.S.; and J. W. Tutt, F.E.S. The President read his address, and votes of thanks to the retiring Officers and Council were passed. A proposal was made to close the rooms during the summer holiday season, but it was not passed by the meeting.

February 14th.—Mr. H. S. Fremlin, M.R.C.S., F.E.S., President, in the chair.—Mr. Garrett, of Brewer's Green, was elected a member. Mr. Colthrup exhibited a drawing of a dashed and radiated under side var. of *Polyommatus icarus*, taken by Mr. Hill, of Folkestone. Mr. Wyandotte, a large number of specimens of amber having insects embedded in them. Mr. West (Streatham) read a paper, "Fossil Insects, with especial reference to insects in amber." He afterwards showed a very large number of photographic lantern slides of insects in amber. Hy. J. TURNER, *Hon. Report. Sec.*

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY.—The Annual Meeting was held on Monday, January 14th, in the new room taken by the Society at the Royal Institution, Colquitt Street, Liverpool. The Vice-President, Mr. E. J. Burgess Sopp, occupied the chair. The Secretary read a report on the work of the year 1900. The Treasurer read his report, which showed a credit balance of 15s. Mr. Pierce mentioned incidentally that the Library had been brought over to the new premises, and would be lodged in an adjoining room as soon as space could be found for it. The election of officers for 1901 was then proceeded with, and resulted as follows:—President S. J. Capper, F.E.S.; Vice-Presidents, R. Wilding and Rev. R. Freeman, M.A.; Secretaries, F. N. Pierce and Fredk. Birch; Treasurer, Dr. J. Cotton, F.E.S.; Librarian, F. C. Thompson. Council, A. Tippins, B. H. Crabtree, F.E.S., R. Tait, E. J. Burgess Sopp, F.E.S., and Dr. H. Dobie. The outgoing Vice-President, Mr. E. J. Burgess Sopp, then gave a most interesting and instructive address. The Rev. R. Freeman proposed a hearty vote of thanks to Mr. Sopp; this was seconded by Mr. Wilding, and carried unanimously. Dr. Cotton proposed, and the members agreed, that the Secretary should write to the President, expressing their regret at this his first absence from the Society's annual meeting for so many years.

Monday, February 11th.—The usual monthly meeting was held in the Royal Institution, Colquitt Street, Liverpool, with the Vice-President, Mr. R. Wilding, in the chair. Minutes of the preceding meeting were read and confirmed. It was decided by a vote that the next meeting should be held at St. Helen's. Mr. F. C. Thompson, Rev. R. Freeman, and Dr. J. Cotton were appointed to make the necessary arrangements. The Secretary read a letter from the President, Mr. S. J. Capper, thanking the members for the regrets and good wishes they had caused to be sent to him on the occasion of his first absence from the Society's annual meeting, held on January 14th, on which date Mr. Capper's place had been filled by Mr. E. J. Burgess Sopp, who gave a stirring address. The joint Secretary, Mr. Frederick Birch, then read a paper entitled, "Our Raid into the Highlands," in which he described what he and his companions, Messrs. J. and H. Tayler, did and saw at Rannoch (north-west Perthshire) in the summer of 1900. Starting from Liverpool by steamer on the 16th of June, they

landed, after a delightful trip up the west coast of Scotland, at Fort William in the evening of the 18th. From thence, wheeling their two hundred pounds of luggage (camping, entomological, and photographic apparatus), they proceed inland to the foot of Ben Nevis. Here they stayed for two days—climbing the mountain, exploring the glen, and learning “what Nature can do in the way of adornment when left to herself.” On the 20th they entrained for Rannoch. Arrived there, they restocked their box with provisions from the single store, and started on a twelve mile walk to the far-famed Black Wood of Rannoch, lying on the flanks of the hills forming the southern shore of Loch Rannoch. Here, betwixt the wide loch and the deep wood, they encamped, and for nine delightful days, lived a wild, free, gipsy life, collecting the insects, observing the wild mammals and birds, and revelling in the primitive loveliness by which they were surrounded. The finest bird seen was an eagle, which the essayist observed (mobbed by lapwings) in its stately flight over the Black Wood. Amongst the rare species of Coleoptera taken may be mentioned *Saperda scalaris* *Eros aurora*, and *Trichius fasciatus*. Of Lepidoptera, the best were, *Dasydia obfusca* and *Psodos trepidaria*. Mr. Pierce proposed a vote of thanks to Mr. Birch for his paper, which was carried unanimously. The Rev. C. J. Buckmaster, of Wigan, gave some interesting reminiscences of the Rannoch district, which extended over a period of thirty years. The following exhibits were made:—*Noctua subrosea*, by Mr. Pierce; Devonshire and local Lepidoptera, by Mr. Tonkin; Scotch Coleoptera and Lepidoptera, by Mr. Birch; *Saturnia pavonia major*, taken in the south of France, by Mr. Gardner; *Ephestia kühniella* feeding on rice, by Mr. Holt; and two species of the genus *Stilicis*, new to the local list, by Mr. Wilding.—FREDERICK BIRCH, *Joint Hon. Sec.*

BIRMINGHAM ENTOMOLOGICAL SOCIETY.—October 15th, 1900.—Mr. G. T. Bethune-Baker, President, in the chair. A letter was read from Mr. C. A. E. Rodgers, mentioning the occurrence of *Colias edusa* on the golf-links at Handsworth, only about four miles from the centre of Birmingham. Mr. T. Clarke exhibited a number of butterflies, mostly taken in Yorkshire forty years ago; they were in excellent preservation. Mr. Bradley, Hymenoptera taken at West Runton, Norfolk, in August last—*Tiphia femorata*, *Mellinus sabulosus*, *Mimesa equestris*, and *Astata boops*. Mr. F. A. Jackson, the following Coleoptera:—*Notiophilus 4-punctatus*, *Bembidium monticola*, *Tachypus flavipes*—all from Tonbridge; *Phyllobrotica 4-maculata* from Bradgate (Leicestershire), *Crioceris asparagi* from Loughborough (Leicestershire), *Apoderus coryli* from Haywood near Birmingham, *Balaninus venosus* from Buddon Wood (Leicestershire), &c. Mr. H. Willoughby Ellis, the following Hemiptera-Heteroptera from Stroud district:—*Elia acuminata*, *Ælioides inflexus*, *Pentatoma verbasci*, *Dasycoris hirticornis*, *Stenocephalus agilis*, *Nabis rugosus*; also, from the Knowle district, *Anthocoris nemorum*, *Monanthia cardui*, *Scolopostethus contractus*, *Acanthosoma griseum*, &c.; also a number of Coleoptera from various places, including *Anoplodera sexguttata* (New Forest, 1898), *Acanthocinus ædilis* (Walsall, 1900), *Larinus carlinæ* (Stroud, June, 1900), *Corymbites æneus* (Dovedale), *Ctenopus sulphureus* (near Cromer), *Melasis buprestoides* (Knowle), *Bryaxis juncorum* (Knowle), &c.: also *Sesia asiliformis* (from

Knowle, July, 1898), and *S. culiciformis* (also from Knowle, May, 1898). Mr. A. H. Martineau exhibited Hymenoptera, including *Crabro 4-maculatus* from Coleshill, *Chrysis viridula*, L., and *Chelostoma campanularum*, Kirby, from Solehill; also *Hæmatopota pluvialis* (male) from Coleshill, and *Platynemus pennipes* (male and female) from Bridgnorth. Mr. G. W. Wynn, *Xanthia citrigo*, *Xylophasia scolopacina*, *Cymatophora duplaris*, and *Gonophora derasa*—all from Haywood this year.

November 19th.—Mr. R. C. Bradley in the chair. Mr. Dixon, 149, Edmund St., Birmingham, was elected a member of the Society. Mr. H. Willoughby Ellis exhibited *Melasoma æneum* from Cannock Chase; *Crioceris asparagi* from Bromsgrove (where it occurred in thousands); *Sinodendron cylindricum* from Knowle; *Byturus sambuci* from Haywood; and *Sitones cambricus* from Knowle; also a few Lepidoptera from Knowle. Mr. G. W. Wynn, a number of Lepidoptera taken at sugar, in his garden at Hampton-in-Arden. He sugared regularly all this summer and found July the best month. *Triphæna ianthina* was especially abundant, often five or six being on one patch of sugar; also two *T. interjecta* turned up; and amongst other things were *Xylophasia sublustris*, *X. hepatica*, *Caradrina morpheus*, *C. alsines*, *C. cubicularis*, *Agrotis nigricans*, *A. tritici*, *A. corticea*, *Noctua umbrosa*, *Xanthia gilvago*, *Tethea subtusa* (1), *Cosmia affinis* (common), *Catocala nupta* (1), *Mania maura*, &c., &c. Mr. A. H. Martineau showed *Crabro clavipes*, *C. tibialis*, *Stigmus solskyi*, and *Trypoxylon clavicerum*, all from Solihull this year. Mr. R. C. Bradley, a number of insects of various orders collected during four days' trip to the Cotswolds, near Stroud, at Whitsuntide this year; amongst other things taken were *Isopogon brevirostris*, *Platystoma seminationis*, *Xanthogramma ornata*, *Trixa æstroidea*, *Hyalomyia pusilla*, and the following bees, *Andrena cingulata*, *Osmia xanthomelana*, *O. bicolor*, *O. cærulescens*, *O. aurulenta*, *Nomada flavoguttata*, *N. laterales*, &c. Mr. Colbran J. Wainwright, his collection of the Diptera of the families Trypetidæ and Ortalidæ, including several interesting species taken this year—*Trypeta cornuta*, *T. tussilaginis*, and *Tephritis bardanæ*; long series from West Runton, Norfolk, where all three species were very abundant; *Urellia eluta* and *stellata*, *Tephritis tessellata*, *Eusnia sonchi*, all from W. Runton, *eluta* being only in italics in Mr. Verrall's list, and *T. tessellata* being absent from it; *Ceroxys crassipennis* from Stroud district, &c., &c.

December 17th.—Mr. G. T. Bethune-Baker, President in the chair. Messrs. Aug. D. Imms, Linthurst, Oxford Road, Moseley, and W. H. Flint, Farm Road, Sparkbrook, were elected members. Mr. R. C. Bradley exhibited *Sirex juvenis*, taken at Bournemouth in August last, and *S. gigas*, taken at W. Runton, Norfolk, also last August. Mr. Colbran J. Wainwright, a number of Aculeate Hymenoptera, taken at W. Runton, Norfolk, July and August last, including *Nysson dimidiatus*, *Astata boops*, *Tachytes pectinipes*, *Mellinus sabulosus*, *Tiphia minuta*, *Andrena cetii*, *A. bimaculata*, *Nomada obtusifrons*, and many others; also three females of *Odynerus gracilis* from Ran Dan Woods, a species not previously known in the Birmingham district. Mr. F. A. Jackson, a number of Coleoptera, including *Chlænus vestitus*, taken at Bewdley on October 19th last. Mr. G. T. Bethune-Baker showed a number of Palearctic *Epinephela* and *Pararge*.

January 21st, 1901.—The President in the chair. Drs. T. H. Wilkins, Small Heath; and W. Wright Mason, University College, were elected members. Mr. R. C. Bradley showed a series of *Pelecocera tricineta* from Bournemouth, where he had taken it fairly commonly this year, more so than anyone had previously done; also *Anthrax fenestrata* from Bournemouth, *A. paniscus* from West Runton, Norfolk, and *A. flava* (?) from Bournemouth, all taken this year by him, though he had never met with a specimen of the genus before; also all three species of *Didea*—*aleti* from Sutton and Wyre Forest, *intermedia* from Sutton, and *fasciata* from Sutton, Wyre, and Poole. Mr. A. D. Imms exhibited *Sinodendron cylindricum* from an old oak at Moseley. Mr. C. J. Wainwright, a series of *Stratiomys chameleon* from West Runton, Norfolk, taken last July and August. Mr. G. T. Bethune-Baker, a drawer full of *Epinephele ianira* and its allies.

February 4th (Annual Meeting).—Mr. R. C. Bradley in the chair. The Annual Report of the Council was read, showing an increased number of members in the Society; and the Treasurer presented his annual statement, showing a small balance in hand. Mr. G. T. Bethune-Baker was re-elected President, and Mr. H. Willoughby Ellis was elected President for the ensuing year; the remaining officers being as before. The following were exhibited:—By Mr. R. C. Bradley, Hymenoptera of the genus *Ammophila*, three species—*sabulosa*, *hirsuta*, and *campestris*—all from Bournemouth, where all three species occurred together last August, the two former in abundance, the latter less commonly. By Mr. Colbran J. Wainwright, rare Diptera taken in 1900; *Oxycera pulchella* from West Runton, Norfolk; *Didea fasciata* and *Melanostoma hyalinatum* from Wyre Forest. By Mr. G. W. Wynn, a long series of *Epunda tutulenta* taken at sugar in Wyre Forest last autumn; they were very constant in coloration, all being dark, but not black, specimens. By Mr. A. D. Imms, *Acronycta alni* bred from a pupa found under rotten palings between Hall Green and Solihull. By Mr. H. Willoughby Ellis, a collection of Coleoptera taken in only three hours' collecting in Bedfordshire at Christmas last; the most noteworthy capture was *Bagous cylindrus*, of which species he obtained three specimens; *Agabus nebulosus* was present in thousands in fine condition.

February 18th.—A meeting of a social character was held at the house of the President, by the kind invitation of himself and Mrs. Bethune-Baker. The members turned up in force, and very much enjoyed looking through the large collection of palaearctic and other Lepidoptera, formed in part by Mr. Bethune-Baker and in part by the late Dr. Jordan.—COLBRAN J. WAINWRIGHT, *Hon. Sec.*

RECENT LITERATURE.

VON LAGERHEIM (G.). (1900, Ent. Tidskr.; see also Bot. Centralbl. lxxxii, 334-6, and Journ. Roy. Micr. Soc. 577).

THIS paper deals with the cultivation of *Septosporium myrmecophilum* by the ant *Lasius fuliginosus*, Latr., in Sweden. "The point of interest is that the motive appears to be different from that in the other known

cases, for there is little evidence that the fungus is used to any extent as food. The ants build their nests usually of rotten wood, at times also of particles of earth, sand, &c. The particles are fastened together by means of a secretion, but the walls so formed are also interpenetrated by fungoid hyphæ, which ramify through their substance and appear to give stability to the whole. In addition to these intramural hyphæ, the fungus also appears as a down-like coating on the surface of the wall. The evidence as to intention on the part of the ants is based on the facts that the fungus occurs as a pure culture, unmixed with other genera; and that it always occurs in the nests. The purpose would appear to be to give stability to the walls, but this applies only to the intramural hyphæ; the object of the extramural coating may be to serve to some extent as food; perhaps it also roughens the walls, and so affords the ants foothold. The fungus must depend for food chiefly upon the mortar-like secretion by means of which the particles of the walls are fastened together." (Proc. Roy. Micr. Soc.).

G. W. K.

Das Tierreich. 11 Lieferung: Forficulidæ and Hemimeridæ. A. DE BORMANS and H. KRAUSS. Berlin: 1900.

IN October last De Bormans and Krauss, in the eleventh number of 'Das Tierreich,' gave to the world a monograph of the Forficulidæ and Hemimeridæ. The bulk of the volume, which is a large octavo of 142 pages, in paper covers, is occupied with descriptions, together with short synonymy and habitat, of 308 species of earwigs; 31 more or less doubtful species; 20 subspecies; and one variety. These are distributed amongst thirty genera (with two more uncertain ones). We believe, however, that the work has been so long in progress that it is even now somewhat out of date. The total does not seem a formidable one for the earwigs of the whole world, though beside it the British list of eight species is meagre indeed, especially when we consider that but three of them—*Forficula auricularia*, *F. lesnei*, and *Labia minor*—can be taken naturally out in the open. The other five are, with us, dwellers within doors, as *Anisolabis annulipes* and *Apterygida arachidis*; or historical, as *Labidura riparia*, *Apterygida media* (= *albipennis*), and *Anisolabis maritima*. For the account of the curious family Hemimeridæ, which seems to lie between the Forficulidæ and the rest of the Orthoptera, Krauss is responsible. He makes but one species, *Hemimerus talpoides*, though perhaps there is a distinct one—*H. hanseni*, both, however, being found in the equatorial regions of West Africa. The book contains a short introduction, a number of tables, and forty-seven clear outline illustrations in the text, forty-six being devoted to earwigs, and the last to *Hemimerus talpoides*. The text is in German, and is well printed by Friedländer und Sohn, of Berlin.

W. J. LUCAS.

British Flies. Vol. viii. By G. H. VERRALL, F.E.S. Pp. 1-691, with 458 text-figures. London: Gurney & Jackson. 1901.

OUR author adopts the Suborders — Diptera-Orthorrhapha, and Diptera-Cyclorrhapha—of Brauer, divisions which are founded on the

form of the pupa. The volume (viii.) under notice treats of the Platypezidæ, Pipunculidæ, and Syrphidæ, three families belonging to the second suborder, and in these families the student of British Diptera will now have an authoritative guide to aid him in his work. There are tables of genera and species, and these, in conjunction with the admirable descriptions, should greatly facilitate the labour of identification of species. The bulk of the four hundred and fifty-eight excellent illustrations, from drawings by Mr. J. E. Collin, represent the more important ornamental or structural characters; full figures of the perfect insect are given of only twenty species. The matter of synonymy is critically discussed in a note, after the remarks on geographical distribution of each genus and species, and there is a full synonymic catalogue at the end of the volume.

If the succeeding thirteen volumes are to be of the same stately form as that now before us, the entire series will constitute one of the most valuable additions to British entomological literature that has been published during recent years. In his prefatory remarks with reference to the scheme of his work he says: "In default of other assistance, the author of the present volume believes himself capable of dealing with all the contemplated volumes, except those portions of vol. i. which concern the Cecidomyidæ and Sciarinæ, which will necessitate extensive biological and minute microscopical work, far beyond his available time and eyesight. If some young student will give a few years to these groups, the British Diptera may soon be as well worked out as the British Lepidoptera or Coleoptera."

We trust that there will not be any great intervals of time between the appearance of the volumes yet to be issued of this great work.

LEPIDOPTERA.—CHR. SCHRÖDER discusses the value of the male genitalia, for specific purposes, in *Eupithecia* (1900, *Illustr. Zeitschr. für Entom.* v. pp. 305-7, fig.).

NENÜKOW has experimented with the eggs and larvæ of *Pieris rapæ*, which he reared under light passing through solutions of various colours. The development was most rapid—both as a whole and in its component periods—under the influence of ordinary white light; after white light, the order of effectiveness is red, violet, green; but under the green rays the development was markedly retarded, and there was great mortality. Neither with *Pieris rapæ*, nor with *Vanessa urtica*, was any change in the coloration of larvæ, pupæ, or adults observed, as the result of development under red, violet, and green rays.—1900, *Journ. Roy. Microsc. Soc.* p. 456, abstract from 1899, *Physiol. Russe*, i. pp. 244-50.

ARNOLD VOELSCHOW records the capture, on July 2nd, 1900, in a swampy meadow in Mecklenburg Schwerin, of a male of *Argynnis aglaia*, with beautiful blue upper surface.—1900, *Societas Entom.* xv. p. 122.

H. STIZ discusses at some length the genitalia of the Microlepidoptera, Pyralidæ, Tortricidæ, Tineidæ and Butalidæ. (1900, *Zoolog. Jahrb. Anatom.* xiv. pp. 135-76; 5 plates).

The 'Entomologische Nachrichten' (1900, p. 365) announces the

publication of a new work on the Larvæ of German Macro-lepidoptera, with analytical tables for the determination of the species.—R. RÖSLER, 'Die Raupen der Grossschmetterlinge Deutschlands,' &c., with 2 plates (Leipzig, 1900, xvi. and 170 pp.).

DIPTERA.

BRUES has investigated the enormously swollen metatarsi of *Bittacomorpha clavipes*, and finds that an enlarged tracheal tube occupies almost the entire cavity. These enlargements probably enable it to be wafted about easily by currents of air, when the insect bears a striking resemblance to drifting thistle seeds. (1900, 'American Naturalist,' p. 677, ex Biol. Bull. 1900, i. pp. 155-60).

IMHOF notes three ocelli (a new feature in the family) in a Tipulid from Baden, *Trichocera*, sp. n. (Zool. Anzeiger, 1900, xxiii. p. 116).

J. C. HUBER publishes a bibliography of the Diptera, Pediculidæ, &c., parasitic on man (Jena: 4 parts, 1899-1900).

HYMENOPTERA.

W. M. WHEELER contributes two interesting papers on Myrmecophiles to the 'American Naturalist' for 1900, viz. (1) "A New Myrmecophile from the Mushroom Gardens of the Texan Leaf-cutting Ant" (pp. 851-62, 6 figs.), and (2) "The Female of *Esiton sumichrasti*, Norton, with some Notes on the Habits of Texan Ecitons," (pp. 563-74; 4 figs.).

MICHAELIS and ZANDER discuss the structure and development of the male genitalia of certain Aculeata (1900, Zeitschr. für Wiss. Zool. lxvii. pp. 439-60; 1 plate (Michaelis), pp. 461-89; 1 plate and 9 figs. (Zander).

C. EMERY revises the nomenclature of the parts of the thorax in Formicidæ (1900, Bull. Soc. Ent. Ital. xxxii. pp. 103-19, figs. 1-14).

GENERAL.

L. B. WALTON discusses the structure and formation of the basal segments of the leg in Insecta. He summarises his conclusions as follows:—

In Hexapoda the "coxa" is composed of two more or less fused segments, "coxa genuina" and "meron." The antecoxal piece results from the chitinization of the membrane connecting the coxa with the sternum. The trochantin probably originated from a lateral portion of the same membrane. Audouin erroneously homologized the lateral margin of the posterior coxa in *Dyriscus circumflexus* with the trochantin of the prothorax and mesothorax. The trochanter represents a distinct segment of the legs. The meron and coxa genuina, together with their corresponding basal segments, epimeron, and episternum, give evidences of a fusion between two primary metameres. The anterior metamere bears the functional, and the posterior the rudimentary leg. Of the primitive Hexapoda, Neuroptera Planipennia exhibit the most generalized condition in the development of the coxa, while in Thysanura and Orthoptera a high degree of specialization is shown.—"The Basal Segments of the Hexapod Leg," in 'American Naturalist,' 1900, xxxiv. pp. 267-74; 6 figs.

THE ENTOMOLOGIST

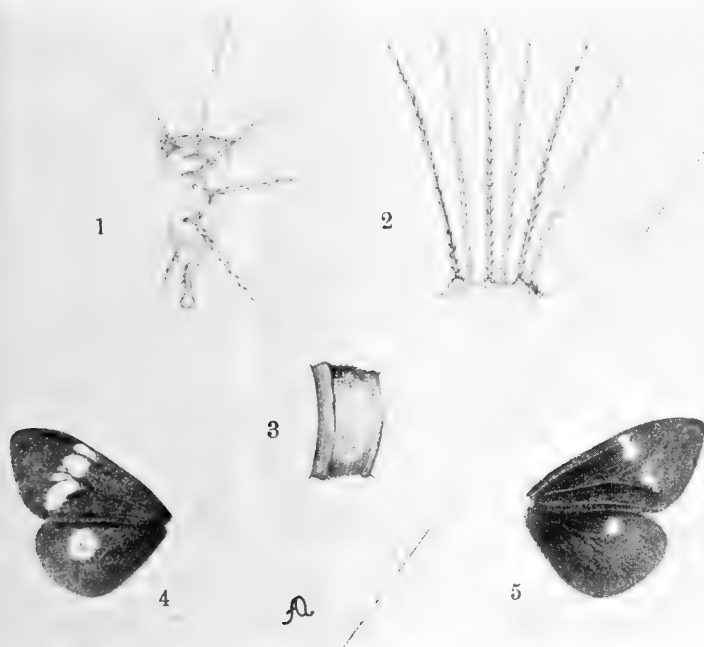
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NYCTEMERA ANNULATA, Boisd., OF NEW ZEALAND: LIFE HISTORY.

BY AMBROSE QUAIL, F.E.S.



NYCTEMERA ANNULATA.—Fig. 1. Third abdominal segment of newly hatched larva, enlarged $\times 200$. Fig. 2. Supra-spiracular tubercle after first ecdysis, enlarged $\times 200$. Fig. 3. Sixth abdominal segment of pupa, enlarged. Fig. 4. *Nyctemera secundiana* of Queensland, nat. size. Fig. 5. *Nyctemera annulata* of New Zealand, nat. size.

This Arctid-Hypsid is very plentiful in New Zealand, and, according to authors, is endemic; but "two closely allied species belonging to the same genus are found in Australia." I believe, no detailed life-history of either species has been published, and this paper may interest some entomologists to compare with the more or less allied *Arctia caia*, as set forth in Dr. Chapman's elaborate paper (Entom. Record, vols. iv., v.).

OVUM.—During the month of March, 1900, I procured several batches of ova from wild females; though some were laid loose, others were deposited in regular order, in fact in hexagonal order. The ovum is globular, a little flat on the attached surface; color yellowish, and the opaque highly polished surface is covered with a very fine hexagonal pattern. The ovum becomes transparent and black a short time before hatching; it hatches in nine days; the empty egg-shell is eaten by the newly hatched larva.

The young larvæ eat the under side of the leaf in patches; they do not eat right through the leaf, but leave the thin upper epidermis. One larva ate right through the leaf while in its first skin, but it seems to be in the last skin preceding pupation when they eat through the leaf as a regular proceeding.

LARVA (newly hatched).—Head dark brown, remaining segments pale in colour; the tubercles and setæ soon become brown, but the spiracles remain pale-coloured. Viewed from above the segments have a lumpy appearance, post-trapezoidal and supra-spiracular tubercles being on conspicuous swellings. The whole larva-skin is covered with minute hairs, and nearly all the setæ of tubercles are spinulose; the structure of the setæ is exactly the same in newly hatched and adult larvæ. Head has more than a dozen hairs on each lobe, six hairs on clypeus; the hairs of the head are smooth. Antennæ are broad at base, narrow middle joint, wider outer joint terminated by three fleshy processes and a bristle. Spinneret short. Prothorax: the dorsal plate has a rounded posterior, is dark in colour, and at either side of the mid-dorsal line are two remote anterior setæ and two remote posterior setæ, which form a transverse diamond pattern; below the plate a subdorsal tubercle has two rims (? with pale smooth hairs); a mid-lateral tubercle bears two setæ; posterior to this is the spiracle; above the leg a large tubercle bears two setæ. Meso-thorax: a large dorsal tubercle on either side of mid-dorsal line bears three setæ arranged triangle pattern; a small subdorsal tubercle bears one pale smooth seta; an anterior lateral tubercle bears one seta; the leg tubercle bears two setæ. Post-thorax: dorsal tubercles bear three setæ arranged in transverse line, otherwise the details are as meso-thorax. All the thoracic legs have smooth hairs at the joints. Abdomen: the anterior trapezoidal tubercles are close together, post-trapezoidals remote, one seta each; the supra-spiracular tubercle bears one seta, and is anterior to the post-trapezoidal and immediately above the spiracle; the subspiracular tubercles are well below the spiracle, remote from each other, and bear one seta each. Segments 1, 2 have two subventral setæ, these are on the base of abdominal feet of seg-

ments 3, 4, 5, 6. Segments 7, 8 have one subventral seta each. Segment 9 has the position of the trapezoidal tubercles reversed; one subventral seta. Segment 10 viewed laterally has two dorsal tubercles and two subdorsal, with one seta each; there are three setæ in the region of base of claspers. The abdominal feet and claspers are cone-shaped at the base, sticking out of which a pedicel or stalk with a broad end has a few terminal hooks. Ventrally the abdominal feet have a seta on the inner side, and corresponding setæ are on the footless segments.

Five days old (first skin full fed).—Length just prior to ecdysis $\frac{3}{16}$ inch; larva is much distended, and has lost the lumpy appearance. Head: dark brown. Prothorax: dorsal plate very dark brown, segmental area white. Meso-thorax: mottled red longitudinally between dorsal and subdorsal tubercles. Post-thorax: the red extends above dorsal and below subdorsal tubercles; segmental area yellow. Abdominal segments are yellowish white, with reddish colour enclosing the post-trapezoidal and supra-spiracular tubercles, connected dorsally posterior leaving anterior trapezoidals on a median patch of yellow colour; transverse mottling connects the supra-spiracular and sub-spiracular tubercles.

Eight days old (second skin).—Length about $\frac{3}{16}$ inch. Similar marking to prior to ecdysis. Head shining black. Pro- and meso-thorax white. Abdominal segments are yellow: between the tubercles transversely the colour is brown connected dorsally. Spiracles brown. Setæ shining brown; all segments appear to be the same size; larva robust. Head: all hairs are smooth. Prothorax: scutellum at either side has an anterior series of five setæ and two posterior setæ. A small subdorsal tubercle bears two hairs, large lateral tubercle about 8 setæ; posterior to this is the spiracle; below the spiracle a large tubercle bears about nine setæ. Meso-thorax: large dorsal tubercles, one at either side of mid-dorsal line, bear about fourteen setæ; a small subdorsal tubercle has one hair; large mid-lateral tubercle bears nine setæ; a large tubercle above legs bears about nine setæ. Post-thorax as meso-thorax. All the thoracic legs have spinulose setæ at the joints. Abdomen: the anterior trapezoidal tubercles are minute, with a single spinulose seta each; post-trapezoidal tubercles are mid-dorsal at either side with six setæ each; supra-spiracular tubercle (subdorsal) are very close to post-trapezoidals, but moved a little forward; these have seven setæ. The spiracle is anterior below the supra-spiracular tubercle; two large tubercles, one below the other under the spiracle, bear eight setæ each. It is difficult to make sure of the tubercles, owing to the numerous setæ. Segments 1, 2, 7, 8 have a small subventral tubercle with four setæ (short). Segments 3, 4, 5, 6 have corresponding tubercle at base of abdominal feet, which are also covered with numerous short spinulose setæ. Segment 9 has a very large subdorsal tubercle with about seventeen setæ; lateral tubercle with about eight setæ, and subventral tubercle with four setæ. The ventral tubercles have about five setæ each, and the abdominal feet have numerous spinulose setæ all over inner side. Terminal hooks are only on inner side of the abdominal feet. The whole larva-skin is covered with fine hairs.

The complete change after first ecdysis to tubercle structures with many setæ is of great interest. The tubercles are elevated cushions which form a common base for the setæ. Dr. Chapman details similar alteration from tubercles with single setæ in first skin, to tubercles with numerous setæ in *Arctia caia*; in the latter species, however, the supra-spiracular tubercle bears two setæ in first skin.

It is unnecessary to detail the structure in each skin; I noted in third skin that the 10th abdominal segment has two dorsal tubercles with numerous setæ. In succeeding skins the tubercles become more setiferous, and the colour and markings tend to that of the adult larva. I counted on the abdominal post-trapezoidal tubercles twenty setæ in the sixth skin. The skins were changed at 13 days old, to third skin; at 20 days old, to fourth skin; at 30 days old, to fifth skin; at 45 days old, to sixth skin.

Immediately after change into sixth skin the larvæ went into hybernation. Three larvæ hybernated on the side of a glass jar, and never moved until near completion of hybernation; they remained close to the cast skins. One larva hybernated in its fifth skin, but was restless, and wandered about on warm days; it changed its skin in about a month, and then settled down quietly. One larva I suspect had not changed its skin, and remained always more or less restless, and would not feed. One larva was in its first skin (hatched same time as the others) when the others went into hybernation; this simply became defunct. The normal position of the larvæ in hybernation is head downwards. Only two larvæ recommenced feeding after hybernation, the others appeared too weak to do so, and although they wandered over the food, they did not eat, but died off. The hybernating period lasted 126 days.

At 19 days after hybernation = 190 days old, change to seventh skin. At 202 days old, change to eighth skin. At 214 days old, one larva commenced to make shroud in which to pupate. At 215 days old the shroud, or loose horizontal cocoon similar to that of *Arctia caia*, was completed; a quantity of broken setæ are intermixed with the threads. The larva became much contracted, rested on its dorsum within the cocoon, and turned to pupa during the morning at 216 days old.

Seven days later the second larva pupated; at the same date wild pupæ could be obtained; and five days after this I observed the first wild imago; and on subsequent days others were noticed. My friend Mr. A. Bacot describes the tubercle setæ of certain Liparid larvæ as having a bulbous swelling, and that *Lithosia complana* and *L. griseola* also have similar setæ (Entom. Record, vol. x. 74). I carefully examined the setæ of *Nyctemera annulata* for this form of seta, but such was not present; those setæ which are not spinulose throughout their length are simple, *i.e.* smooth as mentioned.

PUPA.—Length $\frac{5}{8}$ inch, at widest nearly $\frac{1}{4}$ inch. The ground colour is black; there is a slight brownish tinge on some; one specimen has the wing-cases almost wholly yellow, but normal specimens have only the nervures of a yellow colour. Some yellow spots on the abdominal segments form three longitudinal lateral series, and two ventral series, and one mid-dorsal. The shape is robust, thickest at 3rd abdominal segment. The head is ventral, meso-thorax swollen anteriorly, and a waist is formed dorsally at the juncture of post-thorax and 1st abdominal segments. The wing-cases extend to the ventral posterior edge of 4th abdominal segment. Spiracles are conspicuously elevated, position on 2nd abdominal being almost dorsal; 3rd subdorsal 4, 5, 6, 7, 8 normal. The abdominal incisions are distinct and sharp; anterior edge of segments has a flat sloping rim, and all, except the posterior fixed segments, are covered with innumerable minute pits (only distinguishable under microscope, and probably associated with the fine larval hairs). I cannot detect setæ (corresponding to tubercle setæ of larva). The terminal segment is round and blunt; the anal armature consists of two sets of hooks, twelve each, at either side of the dorsal posterior extremity. Dehiscence: dorsally split down middle of meso-thorax and post-thorax, and transversely at suture of same; the headpiece, with eyes, legs, and antennæ intact, separates from costal edge of the wing-cases, except at their tips.

The first imago, a male, appeared after thirty-two days in pupa. Second imago, a female, appeared five days later, after a period of thirty days in pupa. Thus, from May 10th, 1900, when the ova were deposited, to November 23rd, 1900, when the male emerged = 257 days, of which 126 days were passed in hybernation. Wild imago females of *N. annulata* continued to deposit ova right up to the time that my larvæ went into hybernation, but I have little doubt that the progeny from these never pass through the winter, and that the race of *N. annulata* is maintained by those individuals which succeed in attaining at least the sixth skin before winter.

So far as I can learn, thanks to the kindness of Mr. R. Illidge, of Queensland, *Nyctemera secundiana* is more closely allied to *N. annulata* than any other species; it is interesting to observe in the latter the decrease in size of the white wing-marking—indeed, I have one specimen, sent by Mr. G. Howes from the extreme south of New Zealand, in which the white spot of the hind wings is almost obliterated. I have little hesitation in believing that *N. annulata* of New Zealand has been directly derived from the Queensland species *N. secundiana*.

Palmerston North, New Zealand: Jan. 22nd, 1901.

MARGINAL WING-BRISTLES IN LEPIDOPTERA.

BY PROF. C. H. FERNALD.

IN the February number of this Journal (*ante*, p. 47), Mr. Ambrose Quail gives an illustrated article on the above subject, and states that he has read a great deal that has been written in reference to wing-structure in the Lepidoptera, but finds no reference to the presence of erect marginal bristles at regular intervals on the wings of certain Lepidoptera.

I have figured and described these bristles in two different works—'The Crambidae of North America,' p. 10, plate A, fig. 11 (1896); 'The Gypsy Moth,' p. 341, plate 52, figs. 8 and 9 (1896). I have observed these spines in the wings of many of the Lepidoptera, and have never examined the wings of any Lepidopterous insect without finding them. I should therefore be surprised if they are not found in all the species of this order.

They are not always curved as shown in Mr. Quail's illustration; but, while some are curved, others on the same wing are straight, as those figured in the Gypsy Moth, mentioned above, which under high powers of the microscope appeared to be hollow, with a minute opening at the outer end. While I do not feel like expressing a positive opinion as to their function, I had supposed that they might be connected with scent glands beneath, or that they might be sense organs of some kind, and that the two circles near the end of each vein, which are more easily seen than these spines, are also sense organs.

I have less doubt about the function of the spiny area near the base of the under side of the hind margin of the fore wings of many (not all) Lepidoptera, and also in a few species in other orders. A good account of this area and its function may be found in 'Psyche,' vol. vii. p. 395, pl. 9 (1896).

Amherst, Mass., U.S.A.

DESCRIPTIONS OF FOUR NEW SPECIES OF *DISONYCHA*.
(COLEOPTERA PHYTOPHAGA, FAM. HALTICIDÆ.)

BY MARTIN JACOBY, F.E.S.

DISONYCHA FLORIDANA, sp. n.

Head fulvous; antennæ (the basal joint excepted), the tibiæ, tarsi, and the breast black; thorax impunctate, pale fulvous, margined with flavous; elytra punctured near the suture with five more or less distinct longitudinal costæ, pale fulvous, with a subsutural and a submarginal narrow flavous stripe joined at the apex. Length $5\frac{1}{2}$ millim.

Head impunctate, fulvous, the anterior portion paler, the frontal elevations flat and but feebly raised, clypeus broad, labrum and palpi

black; antennæ scarcely extending to the middle of the elytra, black, the basal two joints (sometimes) flavous; the fourth and fifth joints equal, longer than the third; thorax more than twice as broad as long, the sides feebly rounded, with a narrow margin, the anterior angles obtusely rounded, the posterior ones oblique, the disc with an obsolete transverse sulcus near the base, impunctate, pale fulvous, all the margins narrowly flavous; elytra with a few fine punctures near the suture, the rest of the surface impunctate, with five more or less distinct longitudinal costæ, the first and the fourth pale flavous, the lateral margins and the elytral epipleuræ of the latter colour; the breast and the basal segments of the abdomen black, the others flavous; the femora fulvous; the tibiæ and tarsi black.

Hab.—East Florida, St. John's Bluff.

This species, of which two exactly similar specimens are contained in my collection, does not seem to have been known to Dr. Horn, who published a "Monograph of the North American Halticidæ" (Trans. Am. Ent. Soc. xvi. 1889). *D. pensylvanica*, Illig., seems the most nearly allied species, but differs totally in the coloration of the head, the elytra and under side, and in the want of the elytral costæ. *D. costipennis*, Jacq. Duval, from Cuba, seems to agree in the costate elytra with the present insect, but the author says nothing of the pale thoracic margins nor elytral bands, nor does Suffrian, who had seven specimens of the last-named species before him, mention this character, although he gives a detailed description of the Cuban insect. I must therefore consider this well-marked American form as new.

DISONYCHA ARGENTINENSIS, sp. n.

Flavous; head and antennæ black; thorax flavous, closely and strongly punctured; elytra nearly impunctate, black, a subsutural and sublateral posteriorly united band flavous; the breast, the knees, the apex of the posterior femora, and the tarsi black. Length 5 millim.

Head deeply rugose-punctate, black with æneous gloss; antennæ short and stout, black, the basal two joints more or less stained with flavous; thorax twice as broad as long, the lateral margins feebly rounded, the anterior angles slightly produced outwards but not pointed, posterior margin oblique at the angles, the surface closely and strongly punctured, flavous, the punctuation partly confluent at the sides; scutellum broad, impunctate, blackish æneous; elytra extremely finely punctured near the base and suture, the rest of the surface nearly impunctate, black, with a narrow subsutural and submarginal flavous band joined at the apex, below flavous; the breast, the knees, the extreme apex of the tibiæ, as well as the tarsi, black; the posterior femora also with a black spot at the apex; the abdomen sparsely clothed with pale pubescence.

Hab.—Argentine R.

There are four specimens of this species before me which differ from any of its nearly similarly coloured allies by the rugose sculpture of the head and the close and strong punctuation of

the thorax; the flavous elytral bands are about half the width of the discoidal black vitta, in which respect the species somewhat resembles *D. glabrata*, Fab. In two of the specimens this black intermediate band is emarginate at its outer margin, but no other differences are to be found. If the flavous colour of the elytra is taken for that of the ground colour, the latter may be described as having a narrow sutural and lateral black margin and a discoidal broader black band not reaching to the apex.

DISONYCHA LABIATA, sp. n.

Broadly ovate, fulvous; the antennæ, the labrum, breast, the tibiæ, and tarsi black; thorax impunctate; elytra scarcely perceptibly punctured, pale fulvous, a narrow sutural and submarginal stripe, joined at the apex, and a broader discoidal one not extending to the latter, black. Length 7 millim.

Head impunctate, with the exception of a punctured impression near the eyes, fulvous; the extreme vertex sometimes black; frontal tubercles obsolete; clypeus triangularly thickened with a small fovea above its base; labrum black; antennæ rather slender, black, the joints, with the exception of the small second one, elongate, the third slightly shorter than the fourth joint, the basal one more or less fulvous; thorax distinctly narrowed anteriorly, scarcely twice as broad as long, the sides rounded, narrowly margined, the anterior angles slightly oblique, not produced, the surface entirely impunctate, rather convex; scutellum black; elytra very minutely, sometimes scarcely perceptibly punctured, convex, the suture of each elytron and a longitudinal stripe close to the margins very narrowly black, joined at the apex, the middle of the disc with a broader band, not quite extending to the apex; below fulvous, rather densely clothed with grey pubescence; the breast fuscous; the extreme apex of the femora and the tibiæ and tarsi black.

Hab.—Mexico.

Of this species I have lately received two exactly similar specimens without detailed locality which do not agree with any of those described by me in the 'Biologia Centr.-Amer.,' nor with those described previously. The insect seems to be intermediate between *D. carolina*, Fab., and *D. crenicollis*, Say. It differs from the first-named in the black labrum (always pale in the allied species), in the unspotted thorax, and in the black tibiæ; from *D. crenicollis*, with which the species has the black labrum in common, it differs in the width of the discoidal black band, which is distinctly narrower than the fulvous portion, not as wide or wider, as Dr. Horn gives as one of the distinguishing points; there is also an absence of the three black thoracic spots in the present species.

DISONYCHA VENEZUELÆ, sp. n.

Elongate and parallel, black; thorax closely and finely punctured, fulvous, with a transverse black band; elytra extremely closely punc-

tured, black, with a subsutural and submarginal fulvous slightly raised band, joined at the apex. Length 7 millim.

Head closely punctured, with a smooth narrow central line; frontal tubercles distinct; antennæ extending nearly to the middle of the elytra, black, the lower three joints more or less fulvous below, terminal joints shorter than the intermediate ones; thorax twice as broad as long, narrowed in front, the sides rather strongly rounded, narrowly margined, the anterior angles not produced, the surface reddish fulvous, with a broad transverse black band at the middle, not quite extending to the lateral margins, this band closely and finely punctured, the fulvous portion nearly impunctate; scutellum much broader than long, black, impunctate; elytra extremely closely and distinctly punctured, black, with two narrow dark fulvous bands, one near the suture and about as wide as the black sutural interstice, the other near the lateral margin, of the same width and joined at the apex to the subsutural band, both these bands are somewhat convex or semicostate; the elytral epipleuræ, the entire under side and legs black, finely clothed with grey pubescence; the flanks of the thorax and the prosternum fulvous.

Hab.—Venezuela.

The thoracic black and closely punctured band, the very close punctuation of the elytra and the semicostate fulvous bands will distinguish this species (of which three specimens are before me) from any of its congeners.

ON THE MORPHOLOGY AND CLASSIFICATION OF THE AUCHENORRHYNCHOUS HOMOPTERA.

BY DR. H. J. HANSEN.

(Continued from vol. xxxiii. p. 334.)

The Cercopidæ thus differ by the metasternum, by the form and articulation of the posterior coxæ (partly also by their size), by the quality of the articulation between the trochanters and femora, and by the presence of the femoral protuberance just mentioned—from the following and preceding families, and they form in many respects a transition between them and the extremely remarkable Fulgoridæ.

3. *Jassidæ*.—The metasternum is *strongly chitinised*, and forms merely a narrow transverse belt, except at the middle line, where it sends a longitudinal narrow plate backwards between the posterior coxæ. These are *very large*, and their articulation extends right across to the lateral margin of the body, and nearly to the middle line. Their free distal part is proportionately moderately short, and directed downwards, backwards, and towards the middle plane, so that the interior angles of the two coxæ approach together in the middle line; the trochantins are

of considerable size; *the coxal movements are similar to those in the Stridulantia*, and there is no meracanthus. The trochanters are supporting, and the movements between them and the femora are not so altogether feeble. The femora present nothing distinctive.

4. *Fulgoridæ*.—The metasternum (pl. ii. f. 6) has a *considerable length in the direction of the insect's longitudinal axis*, and is (with the exception of a small somewhat firm plate (b¹) anteriorly in the middle and a narrow transverse strip, which is partly covered by the middle coxæ, along the anterior margin) *completely membranous* (b) *right up to a small space from the insect's lateral areas*; while the latter (c), which are bent somewhat inwardly and ventrally, are strongly chitinised. The posterior coxæ are most nearly contiguous at the middle plane of the insect, and are inserted as far back as possible on the metathorax; so that, in spite of their feeble extension in the direction of the insect's length, they reach somewhat backwards over the base of the abdomen, whose ventral surface lies in a plane which, seen from below, is considerably lower than that of the metasternum. The coxæ are contiguous anteriorly with the metasternal membrane, but laterally they are limited by firm chitin (7a), *with which they are consolidated* so intimately, that a true separating suture has disappeared, and one can at most find only a feeble furrow (b). The presence of a more or less developed meracanthus (7d), and a comparison with the structure in the Cercopidæ, make it clear that the coxæ extend out to a shorter distance from the lateral margins of the insect. (The whole structure of the coxæ and their attachment are, moreover, so different from other Auchenorrhyncha, that I do not see my way to elucidate all the questions hither appertaining. A large prolongation of the coxal chitin is thus continued forward and somewhat outward within the interior of the metathorax, but the significance of this is unknown to me.) The trochantins I have not been able to discover. The trochanters (fig. 7e) *are short and much thicker, up to twice as thick as the femora*; their movements with the coxæ follow a very exact and precise plan, but the axis is sometimes (as, for example, in *Fulgora*) nearly perpendicular to the body, sometimes more oblique; movements in the given plane are very large, and the connecting membrane facing the middle line has an extraordinary breadth, which is easily seen, for example, in *Fulgora*. The articulation between the stout trochanters and the femora (g) differs very much from the condition in other Auchenorrhyncha, *for they admit of a by no means feeble movement in several directions*. The femora are almost equally stout everywhere, and *near the base one finds on the dorsal side an oval or rounded, bright whitish or yellowish spot* (f. 8a), which is somewhat convex, sharply limited, and whose outer chitin-layer shows, seen with about 600 diameters, a

peculiar punctured and rugulose appearance. I have made further researches on the structure of an alcoholic example of *Calyptoproctus stigma*, Fabr., and found that the usual chitinous skin of the femur at that place where the spots occurred was darker than its environs, solid, and punctured in like manner, and that the substance which formed the bright spot situated on the skin could be cut off as slices, and resembled chitin of a peculiar loose and tolerably soft consistency. This would indicate that that spot is a peculiar organ, but its nature is quite enigmatical to me. Spots of this nature are found in *all* the Fulgoridæ examined by me, and they are usually easily enough discernible with a lens on dried specimens when the abdomen is raised somewhat upwards, or the posterior femora turned somewhat downwards. The presence of this may be considered a good family character.

The posterior coxæ are, as has been said, *immovably fixed to the metathorax*, but the circumstance that the metasternum nearest to it is entirely membranous, and that the extent of the coalescence between the posterior coxæ and metathorax is proportionately somewhat short, allows, it would seem, a certain elasticity.

The largest and most powerful movement of the legs originates from the articulation between the coxa and trochanter, and as the insects—as is well known—can leap, one would expect to meet with strange modifications of organization; and one really finds that there projects forward from the inner side of the trochanter *a powerful tendon* (pl. ii. f. 7 f) *terminating in an exceedingly large, flat, plate-like bowl* (f¹), which receives the obliquely forward and somewhat outwardly directed *adductor muscle* (which is often visible through the metasternal articulation, and astonishingly strong), the contraction of which certainly produces the spring. (In the other saltatory Auchenorrhyncha, one finds, as was to be expected, the same muscle with the tendon and its dilatation, but not so powerfully developed.) The uncommonly free movements between the trochanter and the femur may thus surely enough, in part at least, both fill their usual rôle, and at the same time compensate for the movements lost on account of the firm fixation of the coxæ, for the legs can, as a matter of fact, serve for leaping and walking, or clambering upon plants, and the movements of the femora in one single plan, resulting from the fixed segment-axis in the articulation between the coxa and trochanter, are scarcely sufficient for these purposes.

2. Tarsi.

These are, as is well known, always trisegmentate, except in a few Stridulantia, where the number of segments is reduced to two. The tarsi are always terminated by two equal claws, which I have always found to be simple, without teeth or other

peculiarities. Furthermore, it is well known that an empodial formation exists in all families except Stridulantia.

This empodium is, what has apparently hitherto escaped notice, differently formed in these families. And, first of all, I may say that I have never found fastening-hairs on the empodia; and that in the same insect these are essentially similar in all three pairs of legs. For practical reasons, I describe the tarsi of the Jassidæ before those of the Cercopidæ.

1. *Jassidæ*.—The empodium is *always firmly fixed to the inner surface of the claws out to a short space from or even more nearly out to their apices, while its free terminal margin is always deeply incised* in the middle line (pl. ii. f. 9, tarsus of *Ledra aurita*; f. 10, of *Ulopa reticulata*; f. 11, of *Membracis tectigera*). From observations upon dry specimens with a lens, one receives, as a rule, the decided impression that the empodium forms a thicker rampart along each claw from base to close out to its apex, and that between the claws it is cleft close to the base; this form is fundamentally different from that which one observes in dried Fulgoridæ (see below). On account of the contraction caused by the shrinkage in drying, the cleft appears in dried specimens to be very much stronger than it actually is in fresh material; but, when treated with potash, the empodia regain practically their proper form as they are represented in my figures. In the forms examined by me the empodia have at the middle, or towards the base, two short and broad, or long and narrow, somewhat firmly chitinised plates (ff. 9 and 11 l) on the upper surface, the rest of which is for the most part, or totally, membranous; the under surface is membranous, and does not possess longitudinal plates or the processes occurring near the outer angles of the empodia in the following family.

2. *Cercopidæ*.—In these the empodia are proportionately thicker and more substantial than in the Jassidæ; in many, and especially in larger forms, they are united with the inner surface of the claws for a good half of the length of these; in others the connection with the claws extends out to a little way from the apex of the latter, and in these forms they are very strong and thick. In a softened and distended state their apical margin often reaches out a good way beyond the claws (pl. ii. f. 12), but this margin is, contrary to its state in Jassidæ, not sharply nor deeply incised, *but entire or somewhat emarginate*. The upper surface is towards the base occupied by a triangular chitinous plate (12 l), which is more or less membranous along the middle line, and which manifestly answers to the two separated plates in the Jassidæ. Exterior to this plate one (always?) finds in the middle line a peculiar bristle (g), consisting of a thicker cylindrical basal part, and, jointed to this, a bristle-shaped terminal portion along the under side (12 a, b) runs close to the lateral margins, a firmly chitinised setiferous band; similar

setæ were found in *Ledra*, but in this form the darker coloured bands were wanting (m). In all the forms examined with the microscope (see enumeration at the observations on antennæ) a peculiar process (n) is found, projecting somewhat from the inner surface of the claws at the place where their connection with the empodia terminates. This process—which is generally firmly chitinised, sometimes, however, slight and feeble, but always furnished with small chitinous bristles—is not firmly united to the claw, and appertains decidedly to the empodium, although, seen in profile, it usually resembles a tap (or stopple) from the inner margin of the ventral part of the claw. These processes are easily seen in many dried examples of exotic Cercopinae and Aphrophorinae, but in several forms I have not been able to detect them with certainty, and I have no very precise opinion whether they are then actually lacking, or (as in *Philænus spumarius*) only very small and feebly developed. The tarsi of *Machærota*, which have been examined with a lens, seem to accord with the other Cercopidæ.

Family-characters, therefore, may be stated thus :—*The empodia are very thick, united with the claws for a considerable, or very considerable, part of the length of the latter, their free apical margin is not properly incised, and on their under side are seen two firm longitudinal bands.*

3. *Fulgoridæ*.—In *Fulgora* the empodium, seen from above (f. 13), is short, almost rectangular, oblique, partly somewhat firmly chitinised, and is only united with the claws closely around their base, and for the rest projects freely forward between them. In *Calyptoproctus*, *Dictyophara*, *Cixius*—and the *Delphax* group (f. 14) and *Pæcilopectera* (f. 15) the empodia are notably stoutly formed (strongest in the two last named types), and project for some distance forwards between the claws, but are only united with these for a shorter (not nearly half the length of the claws), or very short, space, and may be either (*Megamelus*) considerably—somewhat diffusedly—chitinised, or, on the contrary (*Pæcilopectera*), entirely membranous with a couple of small chitinous strips out near the margins on the upper side. In *Tettigometra* (f. 16) they are entirely membranous, and reach, seen in profile, out to a trifle from the apices of the claws; seen from above, however, they are united with the inner margin of the latter, only for somewhat over half of their length. In *Calliscelis** they reach, when the tarsi with extended claws are

* In this form the basal segment of the posterior tarsi is strongly dilated, and the under surface partly beset with peculiar bristles (pl. ii. f. 17 b), many of which are flattened, spatula-shaped, with rounded-off ends; while others are longer, pointed, and somewhat flattened out. These do not appear to be fastening-hairs of the quality which are found, for example, on the tarsus of Cerambycidæ. Some dilation is also seen in the middle segment of the tarsus. Similar tarsal structure has been also observed in *Eurybrachys*.

examined from above (f. 17), even much beyond the apices of the latter, but it is evident too that their edges at the angles incline very strongly around, so that the real union with the claws takes place farther back, and at least their *apical third is free*. The empodium has on its upper surface two stout chitinous plates, on the under surface (f. 17a) two bristles. In *Issus* a similar structure is observed; more than half of the claws, however, are in this case free.

To summarize: *at least the exterior third and generally more, or considerably more, than one-half of the claws are free, without union with the empodia, which with a free portion extend anteriorly between them, and whose free apical margin is rounded, truncated, or at most slightly emarginate, never more deeply incised. Even in dried specimens these characters—peculiar to this family—are usually easily discernible.* I have not found chitinated bands on the under side, nor a process at the apex, as in the Cercopidæ.

(To be continued.)

A PRELIMINARY LIST OF THE LEPIDOPTERA OF WEI-HAI-WEI.

BY THOMAS BAINBRIDGE FLETCHER, R.N., F.E.S.

ON the 24th of May, 1898, the Union Jack was hoisted at Wei-hai-wei, which from that date, though nominally "on lease," has practically been a British colony. The principal feature of our new possession is Leu-kung-tao, or the Island of Leu-kung, lying roughly east and west, some three and a-half miles long by a mile in extreme breadth, and rising to 600 ft. (Centurion Hill) at the western end. The north side is steep and abrupt, but the south side slopes down more gradually and overlooks the harbour of Wei-hai-wei, which is some two miles across. On the further side of the harbour is the mainland, sweeping in a curve around the whole southern side of the island; it is for the most part hilly, the highest point (Mount Goschen) rising to about 1800 ft. The hills themselves are mostly rather bare, covered with loose jagged boulders, and scantily clothed with grass and a few small bushes; but their slopes support a more luxuriant vegetation, consisting of small firs and dwarf oaks, whilst in the valleys willow and alder are plentiful. Nearly all the fairly level ground is under cultivation. There are few flowers, and this fact, with the absence (except for a few willows) of trees of any size, gives the country, at first sight, a rather dreary and barren appearance. The climate is milder than at Peking, the summer temperature only for a short time exceeding 80° F. The rainfall during the

summer is almost entirely in July and August, the remainder of the period, from March to November, being dry and sunny.

Chifu (Chefoo) is some forty miles along the coast to the westward of Wei-hai-wei, and is so similar in physical and faunistic features that I have included captures made there in the present list.

Wei-hai-wei seems to be well within the Palæarctic Region, the Oriental Region not extending north of the Chusan Islands on the mainland, though there is a considerable admixture of Oriental with Palæarctic forms in the south of Japan.

The periods during which I was at Wei-hai-wei or Chifu were April to July, October and November, 1898; 19th April to 20th June, 1899; and 26th September to 13th October, 1899. Most of my collecting was done in Leu-kung-tao, and on the mainland around "Flagstaff Camp" (the nearest point to the island) and the walled city of Wei-hai-wei, which gives its name to the district, and on the slopes of Mount Goschen at the back of Flagstaff Camp. If anyone were to reside on shore with opportunities for night-work, the list of moths would almost certainly be increased to five or six times its present dimensions. Indeed, I myself have some thirty or forty additional species, which I was unable to identify during my brief stay in England.

The identifications were made in most cases from specimens in the National Collection, and I have to thank Dr. A. G. Butler, Mr. W. F. Kirby, and Mr. F. Heron, for their kind assistance in naming my captures.

RHOPALOCERA.

Fam. NYMPHALIDÆ.

Sub-Fam. NYMPHALINÆ.

Argynnis adippe, L.—Occurs abundantly from June to September; I have found it as early as 27th May and as late as 16th October. It has a great liking for tall flower-heads, especially thistles, and it is a fine sight to watch them sail from flower to flower, now exhibiting their tawny velvet markings, and now flashing their silvery lustre in the sunshine. The type, as we know it in Europe, does not seem to occur, the specimens ranging from var. *coretippe*, Leech, to var. *nerippe*, Felder; this latter is often reckoned a distinct species, but I prefer to consider it here as a form of *adippe*. Some of the females, taken in July, are very dark, and look quite black when on the wing.

Polygonia c-aureum, L.—Worn specimens are fairly common in April, but I have seen none in the autumn.

Pyrameis calirrhoe, Fb. (= *indica*, Herbst.).—Moderately common on the mainland hills in May and June; I have seen none in autumn. Apparently does not occur in Leu-kung-tao, as it is essentially a hill species, rarely descending below 1000 feet.

Pyrameis cardui, L.—Abundant all the fine weather—May to October. Especially fond of hill-tops.

Hestina assimilis, L.—Occurs on the mainland hills in June and July, but is not very common.

Sub-Fam. SATYRINÆ.

Pararge (Crebeta) didamia, Ev.—Common in the hills, being especially fond of a bare hill-side strewn with fragments of rock. Appears in May and again in August, being double-brooded. The usual form is darker than the type, and some have the ocelli distinctly blue instead of white. The egg is perfectly globular, and of an opaque, very pale greenish-white colour.

Ipthima sp.—One specimen seen on the mainland, 18th June, 1898.

Cænonympha amaryllis, Cram.—Common in June and August, being double-brooded.

Æneis mongolica, Oberth.—Very local. Four females on the mainland, 25th April, 1899, on a hillside covered with stones and coarse grass. They are more strongly marked than in the type. This seems rather a scarce species; it was discovered by the Abbé David in Eastern Mongolia, where it flies in summer on mountains at an altitude of five hundred metres. My specimens, however, were taken at a height of only two or three hundred feet above sea-level.

Fam. LYCÆNIDÆ.

Sub-Fam. LYCÆNINÆ.

Thecla micans, Brem.—One specimen (Leu-kung-tao, 20th July, 1898) intermediate between the type and var. *betuloides*. Two specimens of var. *betuloides* in Leu-kung-tao, at the beginning of June, 1898, flying amongst oak-bushes. Type itself not found. In life, the tails so exactly resemble antennæ, and the anal ocelli so well reproduce the head, &c., that at a cursory glance we can hardly see which is the head. This is probably of protective value, as it might well puzzle a foe such as a lizard.

Amblopala avidienus, Hewits.—Fairly common on the mainland, 25th April, 1899, flying over dwarf oaks. Very hard to catch, and apt to beat itself to pieces in the net. The under side seems beautifully adapted to mimic a dead oak-leaf.

Niphanda fusca, Brem.—Not common. Two specimens on a hill-top in Leu-kung-tao on 12th July, 1898.

Cupido argiades, Pall.—Common all the warm season. There are apparently three broods, in April, June, and September. The forms *amurensis*, Rühl., and *hellotia*, Mén., occur.

Cupido argus, L.—Common in May and September.

Everes fischeri, Ev.—Leu-kung-tao; common on 3rd May, 1899, in sheltered grassy places.

Cyaniris argiolus, L.—Mainland; two females on 18th June, 1898.

Zizera maha, Koll.—Common in grassy places from May to October. The earlier forms fall under var. *marginata*, Poujade, whilst those found later in the year are referable to var. *opalina*, Pouj.

Chrysophanus phlæas, L.—Abundant from April to October, being apparently triple-brooded. Vernal specimens are much more typical (*i. e.* the copper-colour is paler) than the generality of Asiatic specimens; those taken in June are small and much suffused with black, whilst those captured in September are large and dark. They are all referable to var. *chinensis*, Feld., and the two later broods fall under var. *eleus*, Fb. I have seen none as black as those I have taken in Japan (summer brood), in which the copper is almost wholly concealed by black scales.

(To be continued.)

NOTES AND OBSERVATIONS.

THE LEECH COLLECTION OF LEPIDOPTERA.—This exceedingly fine collection has been deposited in the Natural History Museum at South Kensington. We hope to have something further to say touching this matter in our next issue.

NOTE ON A THIRD BROOD OF *SELENIA ILLUNARIA*.—On July 25th last year a typical female specimen of the var. *juliaria* was captured near here, and deposited ova. The larvæ fed up well on plum, and twelve pupated on September 8th and following days. The breeding-cage was kept in a greenhouse, and the weather at the time was not unusually hot; but to my surprise, nine days later four moths had appeared, two of each sex. On comparing the specimens with normal *juliaria*, I was unable to distinguish them. The remaining pupæ, following the ordinary course of things, began to emerge March 16th last, and five imagines have been obtained from them up to the present time. These are all well-marked examples of the large and dark spring form. The imagines of the third brood, which appeared in September, readily paired, and a few ova hatched in about fourteen days. Unfortunately the larvæ fed up very slowly, and did not thrive on the honeysuckle, which was all I had to give them, and only one spun up in a leaf about the beginning of December. This, emerging indoors on March 10th, is a small specimen, not larger than the average *juliaria*, but has the richer coloration which we expect from the winter pupæ of the species. It is sufficient to show that a complete third brood had been interpolated. The occurrence of treble broods of seasonally dimorphous species under conditions approaching those in nature seems of interest, since it may possibly add something to our knowledge of that very interesting subject. The evidence produced above is meagre enough, but so far as it goes shows that *Selenia illunaria* = *juliaria* behaves in a similar way to *Vanessa levana* = *prorsa*, as observed by Weismann in his later experiments (*vide* Ent. xxix. p. 105, *et seq.*). That is to say, the third brood assumes the summer form *juliaria* when it takes the unusual course of developing rapidly the same year. It is also noteworthy that there was no approach to *illunaria* in my specimens, such as might be expected if there were any tendency to alternation of form, apart from the influences of temperature and hibernation.—W. S. GILLES; Bocking, Braintree, April 12th, 1901.

XYLOMIGES CONSPICILLARIS.—In your last issue (*ante*, p. 130), Mr. Doidge mentions breeding this insect from "dug" pupæ. As Barrett, in his 'British Lepidoptera,' says the pupæ are generally found at the roots of trees, it would be interesting to know whether Mr. Doidge obtained his pupæ from such situations, and, still more so, if he could tell us the particular species of tree. As the larvæ feed on bird's-foot trefoil, the base of tree trunks seems an unlikely situation. But I suppose there is no possibility of its being at times a "tree-feeder."—PERCY C. REID; Feering Bury, Kelvedon, April 5th.

VITALITY OF ALPINE RHOPALOCERA.—Mr. Howe's note on the vitality of *H. rupicapraria* (*ante*, p. 131) is interesting, and it must be taken

for granted that winter flying moths are capable of bearing considerable extremes of cold. In a somewhat similar connection I have more than once come across cases in the Alps of what appears to be remarkable recuperative powers in Rhopalocera. I have rarely crossed a high mountain pass, where the snow lies from year's end to year's end, without coming across various kinds of insects frozen on the surface. I remember some years since traversing the Neiderjoch Pass between Vent and Unser Frau on the way to Meran. A number of Pieridi were scattered upon the ice, and among them a specimen of *Colias phicomone*, a high flying species. The Pieridi seemed to be dead, though I did not pick any of them up; the *Colias*, however, I boxed, and on descending below the snow line on the other side, exposed it to the now powerful rays of the sun, with the result that it recovered some semblance of wing action, and when left was fluttering about in the grass. It must have been frozen hard for some hours, as I was on the snow about six o'clock in the morning. But what attracts non-migratory species to these altitudes I cannot determine; yet it is a common experience to meet such generally lowland species as *Gonepteryx rhamni* and even *Papilio machaon* up to eight thousand feet; and among other butterflies which I have found frostbound is *Melitaa cynthia*, an alpine species certainly, and perhaps for that reason the less likely to be surprised on the glaciers. Running water exercises a great attraction for some Lepidoptera. Perhaps the glare of the snow may also have a fascination for others which inhabit the higher regions of the Alps.—H. ROWLAND-BROWN; Oxhey Grove, Harrow Weald, April 9th, 1901.

APPLICATION FOR BRITISH STRATIOMYIDÆ, &c.—In this magazine for August, 1897, I made a request that I might be assisted in examining freshly caught specimens of Platypezæ. The result was astonishing, as fine series of little-known species were sent me from various sources, and I was consequently enabled to clear up many very complicated cases of synonymy, not only for Britain. but also for Europe. I am now working at a second volume of my 'British Flies,' which would be vol. v. of the 'Scheme.' This volume is entitled 'Stratiomyidæ to Cyrtidæ' in my introductory notice. I want to see British specimens of *all* species which appeared in italics in my 'List of British Diptera' for these families. I should also like to see any specimens of *Odontomyia* (except *O. ornata*, *O. tigrina*, and *O. viridula*), and any specimens of *Oxycera* (except *O. pulchella* and *O. trilineata*). *Sargus flavipes* is at present a jumble, and I specially want to see the male of a species which occurs in the Forest of Dean. Any Xylophagidæ will be welcome. *Hæmatopota italica* should be looked for in the neighbourhood of Leigh and Southend in Essex. I should be glad to examine any of the uncommon species of *Tabanus*, and I especially want to see good series of any species of Therevidæ (except *T. annulata* and *D. anilis*), but they must be in *most perfect condition as to their pubescence*. In a similar way I want to see series of the "*Paniscus*" group of the genus *Anthrax*, but the greatest care should be taken that the pubescence is not injured. Specimens of *Scenopinus* are welcome, and I should be glad to receive authentic localities for all species which will be included in the volume.—G. H. VERRALL; Sussex Lodge, Newmarket, April, 1901.

THE LEPIDOPTERA OF LEWIS.—Mr. H. McArthur has started on an entomological expedition to the island of Lewis, where in former years he has obtained some most interesting insects. Collecting in the Orkneys, Shetlands, and the Western Isles of Scotland is not always an unalloyed pleasure. There are difficulties to contend with and discomforts to be borne, which probably few of us feel disposed to encounter. It is therefore largely due to Mr. McArthur, and a few other enthusiastic collectors, professional or amateur, that our cabinets contain specimens from these remote localities. His last journey to Lewis was in 1887, and we believe that little entomological material has been brought from the island since that date.

ERRATUM.—P. 130, last line, for “female” read “male.”

CAPTURES AND FIELD REPORTS.

VANESSIDÆ IN 1900.—With reference to some notes on the genus *Vanessa* that have appeared in your last two or three issues, I thought, perhaps, that a few observations on these insects made in Glamorganshire might prove interesting. *Vanessa urticae* has been somewhat scarce as compared with the three years previous. *V. polychloros* is, as far as my observations go, very scarce in this district; during 1900 I saw but one specimen (September 3rd). *V. (Cynthia) cardui* is during some seasons of frequent occurrence, but during this season I did not see it anywhere in this district, although I saw it several times on the other side of the Channel (Weston-super-mare). It is of *V. io* and *V. atalanta* that I write chiefly, and of these two Vanessids I saw a larger number at one time than has ever before been my lot to witness. During July I saw, in various localities in this neighbourhood, numbers of the larvæ of *V. io*, which led me to expect an abundance of the perfect insect. On July 9th I took ten full-grown larvæ, eight of which pupated on July 11th, the other two on July 12th and 13th; on July 21st they all emerged. On Sept. 3rd I visited “Castell Coch,” near Taff’s Well, about seven miles from Cardiff, and on entering a field that was perfectly blue with *Centaurea cyanus*, I was struck with the number of *V. io* and *V. atalanta*, but this was nothing as compared with what was to come, for on passing out of the field and entering a narrow path, at the bottom of a woody slope, which was thickly clothed on either side with the same pretty blue flower, I was confronted with swarms of these two Vanessids, together with a host of bees and other Hymenoptera and various Diptera. I do not ever remember seeing such a remarkable sight as presented by the two butterflies (of which there must have been several hundreds) as they rested expanded in the hot sunshine, or chased one another from flower to flower, their brilliant colours contrasting with the green and blue of the foliage and flowers, and the more sombre brown of an occasional *Argynnis paphia* or the deep red-brown of *V. c-album*, forming a picture of almost kaleidoscopic beauty. The last-named Vanessid is of pretty general occurrence in Glamorganshire, but never, so far as I have seen, in any numbers. I noticed that the bees were very intolerant of the presence of the butterflies, driving them off the flowers repeatedly, and indeed *io* and *atalanta* seemed to adopt a belligerent attitude towards one another. I hope to visit the same place

again in the autumn of 1901, trusting to see the lineal descendants of my last year's friends. I might mention, *en passant*, that I took a number of *Colias edusa* during September, but did not see *C. hyale* at all. — J. E. CAMPBELL-TAYLOR; Roath Park, Cardiff, April, 1901.

VANESSA POLYCHLOROS.—A fine specimen of the large tortoiseshell, which had evidently hibernated there, was taken in a house at Kingston-on-Thames, in the afternoon of March 31st, and given to me.—H. E. ANNETT; Church Street, Walton-on-Thames.

VANESSA ATALANTA.—A larva of this butterfly, about one and a quarter inch long, was given to me at the beginning of September, 1900. It received no more food, and pupated at the end of the month. From this a very small but perfect imago emerged a few days before Christmas. The pupa had of course been kept indoors. — K. RAINBOW; King's Road, Kingston-on-Thames.

LEUCANEA EXTRANEA AND DASYCAMPA RUBIGINEA AT TORQUAY.—I should be pleased if you would record the following in the pages of the 'Entomologist':—In searching the willow blossom near here, I had the good fortune to capture two specimens of *D. rubiginea*, one of them a splendid specimen; also, later in the evening, I saw a larger moth dart from the blossom and settle on a piece of bramble. This I captured, and found it to be a magnificent example of *Leucanea extranea* (female). As I could hear it very restless in the box I killed it, and, except for a small part of fringe of right upper wing missing (this it knocked off during the few minutes in box), it is in fine condition. I showed it to my friend Mr. Terry, and he, without hesitation, congratulated me.—M. CROCKER; 7, Westbourne Grove, Torquay, April 11th, 1901.

XYLOMIGES CONSPICILLARIS IN SOMERSETSHIRE.—I am glad to be able to confirm the occurrence of *X. conspicillaris* at Taunton, as recorded in the last number of the 'Entomologist' (*ante*, p. 130). On Good Friday, April 5th, a fine specimen of this insect emerged in my breeding-cage, from pupa dug near Taunton early in January last. — ALFRED S. TETLEY; Llwynon, Newtown, North Wales, April 10th, 1901.

LYCENA ARGIOLUS IN LONDON.—At half-past ten o'clock this morning I observed a specimen of *L. argiolus* flying about a chestnut-tree in the garden of Moreton House, which stands at the eastern corner of the Gilston and Brompton Roads, South Kensington. Unless the butterfly had been bred indoors and released on emergence, its appearance at so early a date, considering the cold and backward spring, seems as strange as the locality in which it was observed.—R. S. MITFORD; 35, Redcliffe Square, South Kensington, S.W., April 22nd, 1901.

On April 25th I saw a specimen of *L. argiolus* flying around a lilac bush in Lillie Road, West Kensington.—H. McARTHUR; 35, Averill Street, Fulham Palace Road, W.

EARLY SPRING IN WEST SUSSEX.—For various reasons I was unable to do any field-work before February, when I began pupa-digging. The first emergence was that of *Taniocampa incerta* on Feb. 18th, and on the same date I took a fine dark *Phigalia pedaria*, at light. The first *Hybernia leucophæaria* was taken the following day. On the 25th *Taniocampa pulverulenta* emerged, and I also found two larvæ of *Arctia villica* in their winter quarters while pupa-digging. On the 26th *Taniocampa*

gothica and *T. stabilis* began to emerge, followed on March 2nd by *T. munda*. *Hybernica marginaria* I did not see till March 4th, and on the following day *Eupithecia abbreviata* emerged. On the 11th *H. rupicapraria* came to light—the only specimen I have seen this year, and *Anisopteryx æscularia* has been conspicuous by its absence. *Panolis piniperda* I took on April 2nd, and on the same day found a cocoon of *Dicranura bicuspis*, empty. *Vanessa io* was seen on April 1st, and *V. urticæ* on the 2nd. Two *Xylocampa lithorhiza* were taken on the 4th, and two nice *T. gothica* var. *gothicina*, male and female, at sawfly, on the same evening. *Scopelosoma satellitia* at sawfly on the 5th, and the last *H. marginaria* the same day. *V. polychloros* was first seen on April 9th, and is now absolutely abundant; I see dozens every day. Their courtship is chiefly performed around the tops of the ash-trees, which are now in full bud. If hibernated specimens are any criterion, this should be a great “*Vanessa* year” in this part of the country at least. *V. urticæ*, of course, is everywhere, and *V. io* is commoner than I have seen it for some years. On April 10th *Anticlea badiata* was taken at light, and on the 11th *Gonopteryx rhamni* was seen; this species is also abnormally abundant. On the 14th *Lithosia sororcula* emerged from out of my captures while digging. By the way, I notice this species is almost unanimously given as feeding on the lichens of larch, pine and birch. This cannot be the case here; the insect is fairly common on all the oak-trunks around here, but we have practically neither birch nor pine within six or seven miles. *Pieris napi* appeared on the 17th, and *Taniocampa miniosa* (two) at sawfly on the 18th, while on the same day a fine male *Asphalia ridens* emerged; this from a larva bred last summer. On the 20th *Heliaca tenebrata* emerged from a captured pupa, and on the 21st I saw the first *Pieris napi*.—J. AYLWARD CHURCHILL; Billingshurst, Sussex.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—March 20th, 1901.—Mr. G. H. Verrall, Vice-President, in the chair.—Mr. Willoughby Gardner, F.L.S., Reform Club, Liverpool; Mr. F. Hopson, 16, Rosslyn Hill, N.W.; Dr. C. A. Ledoux, Grahamstown, South Africa; Mr. C. P. Pickett, Leyton, Essex; Mr. W. G. Smith, 164, Wells Road, Knowle, Bristol; Mr. G. A. Waterhouse, B.Sc., Sydney, New South Wales; Mr. H. H. Whyman, M.A., Montreal, Canada; and Mr. F. C. Woodforde, Market Drayton, were elected Fellows of the Society.—Mr. C. J. Watkins sent for exhibition a series of larch twigs, illustrating the winter condition of *Coleophora laricella*, the special feature being the manner in which the cases of the larvæ assimilated in colour with the bark of the larch.—Mr. G. B. Routledge exhibited a specimen of *Hydrilla palustris*, taken on the wing by Mr. J. E. Thwaytes when sugaring near Carlisle on June 10th, 1899. He said it was the first male taken in that district, and Mr. C. G. Barrett remarked that it was the most definitely marked specimen of any known, and that in the northern locality the lines on the wings seemed to be brought out with greater distinction than in the fen country and elsewhere. He also exhibited specimens of *Bembidium schuppeli*, a rare beetle captured on the banks of the river Irthing.—

Mr. R. McLachlan exhibited Trichopterous larva-cases of the form known as "*Helicopsyche*," from the Prony River, New Caledonia, sent to him by Mr. J. J. Walker, R.N. They were large, and remarkable for the size of the individual sand-grains of which they were built up. These sand-grains, Mr. Walker informs him, were water-worn particles of the heavier minerals of the river-bed, such as chrome, nickel, and iron ores. It is possible that similar cases were alluded to by Hagen in the Stett. Entom. Zeitung, 1864, p. 129, from the Munich Museum.—Mr. G. T. Porritt exhibited specimens of an almost black form of *Acronycta menyanthidis* from Skipwith Common, near Selby, and stated that the same form was also common on Strensall Common, near York. For comparison he also showed specimens from the moors near Huddersfield. The chief interest in the exhibit consisted in the fact that in both the districts where the melanic *menyanthidis* occurred, melanism was not a common feature; whereas in the Huddersfield district, where only the pale form of *menyanthidis* was taken, melanism was a conspicuous feature in many species, even in and close to the grounds where only pale *menyanthidis* could be found.—Mr. H. W. Andrews exhibited a female specimen of *Amphidasys betularia*, with hind wings aborted and scarcely developed, taken at Paul's Cray, Kent, in May, 1896.—Mr. H. Rowland-Brown stated that he had seen an announcement that the County Council had under consideration the feasibility of stocking the London parks with Butterflies, and encouraging those which already existed there. He said that, according to the latest observations, thirty-nine species of Rhopalocera were recorded within, roughly speaking, a ten-mile metropolitan limit, but that of these he only knew of *Pieris rapæ*, *P. napi*, *Vanessa atalanta*, *V. urticæ*, and perhaps one or two others which could, strictly speaking, be said to inhabit the Metropolis itself. A discussion followed on the subject, in which Mr. A. J. Chitty said that *Pieris brassicæ* had occurred in the garden of his London house, and that he thought *Vanessa polychloros* might be added to the list of those open to experiment, though Mr. R. MacLachlan thought that it had ceased to be a London insect. Mr. G. H. Verrall also advocated the introduction of tropical and other foreign species in the great conservatories of Kew, where, without danger to the plants, they would be objects of great beauty and attractiveness. He considered the experiment, at any rate, worth the trial. Mr. H. Goss continued the discussion, and Mr. F. Merrifield, while recognising the difficulties arising from soil, climate, and surroundings, expressed his belief that certain hardy species would be more than a match for their bird enemies.—H. ROWLAND-BROWN and H. GOSS, *Hon. Secretaries*.

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY.—*March 11th*, 1901.—Mr. F. R. Dixon-Nuttall opened the meeting by giving the Society a most cordial welcome to St. Helen's. The Vice-President, Mr. R. Wilding, occupied the chair. Mr. Wilding, in his opening address, said that he thought that the new departure of holding occasional meetings in other towns than Liverpool would be conducive to the life and well-being of the Society. The Rev. R. Freeman began his paper by exhibiting and explaining a coloured map, drawn by himself, showing the district which the St. Helen's naturalists are

working—a district of five miles radius around the town, which comprises woodlands, hills, mosses, marshes, and pastures. From his own particular section of Simonswood, he recorded one hundred and eighty species of Macro-Lepidoptera. The most interesting of these are *Cænonympha davus*, *Notodonta dictæoides*, *Acronycta leporina*, *A. menyanthidis*, *A. alni*, *Mamestra anceps*, *Hudena glauca*, *Heliodes arbuti*, and *Carsia imbutata*. The most abundant species is *Cymatophora duplaris*, whose larvæ occur in thousands on the birch trees. Mr. F. C. Thompson gave his experience of the Knowsley district, which is rich in old woods, mosses, lakes, and pond-holes. On the whole, the species are the same as at Simonswood, with the addition of *Agrotis puta*, *Noctua triangulum*, *Dianthæcia capsicola*, *Epione apiciaria*, and *Ennomos erosaria*. Mr. Alfred Jackson read an interesting account of his doings in the Bold district. He stated that he had taken the eggs, larvæ, pupæ, and imagines of *Odonestis potatoaria* in a single hour. He also described with what delight he had captured his first specimens of *Colias edusa*, an insect he had thought would never have visited this district of smoke. He told an amusing story of a policeman who, attracted by his lantern, became infected with the entomological fever, and chased *O. sambucata* with his helmet, thereafter becoming a zealous collector. Dr. J. Cotton read notes on the Eccleston district, and described the sight which may be seen on a favourable August night at Eccleston Mere of thousands of *Xanthias* (*X. cerago*, *silago*, and *ferruginea*) sitting on the leaves of the willows which grow there. To the lists of his colleagues Dr. Cotton added *Thyatira batis*, *Plusia festuæ*, and *Melanippe tristata*. The Chairman proposed a hearty vote of thanks to the St. Helen's naturalists for a most enjoyable and profitable evening, which was seconded by Mr. F. Birch, and carried unanimously. Mr. F. R. Dixon-Nuttall, in his reply, described the St. Helen's parks, and assured the members that the smoke of the factories had much diminished of late years. Mr. Wilding exhibited a case of specimens of *Deilephila galii* reared in 1887. Mr. Pierce, a unique collection of *Vanessa antiopa* showing all the variations from the type to the most extreme dark forms. Mr. J. Collins, of Warrington, exhibited the pupæ of *Acronycta leporina* spun up in dead sticks, as found by him on the mosses.—FREDERICK BIRCH, *Joint Hon. Sec.*

RECENT LITERATURE.

Third Annual Report of the Kendal Entomological Society. Session 1900.
 Pp. 31. Kendal: 1901

Contents:—Rules of the Society. List of Members (thirty-three, of whom six are honorary). President's Address (5 pp.). "Notes on *Colias edusa* and *Acherontia atropos*," by Rev. A. M. Moss (7 pp.). "Rearing of Lepidoptera," by Mr. Frank Littlewood (10 pp.). "List of the Macro-Lepidoptera of the Kendal District" (5 pp.). Balance-sheet.

In his interesting remarks on the occurrence of *C. edusa* and *A. atropos* in 1900, Mr. Moss briefly reviews the records concerning the first-named species since 1877. The paper on rearing Lepidoptera is a most useful contribution and worthy of careful perusal. Three

hundred and seventy-four species are enumerated in the local list of Lepidoptera, which is admitted to be incomplete, and it is proposed to publish supplementary lists in each succeeding year. In his address, the president (Rev. A. M. Moss) deals chiefly with the work of the Society, but in his opening remarks he refers to the progress of entomology during the latter years of the nineteenth century. We are pleased to find that the finances are in a flourishing condition, the cash balance at the close of the past year being almost twice as large as that brought forward from the previous year. So far, not much beyond field-work and matters directly connected therewith have been attempted, but these have been well done.

Transactions of the City of London Entomological and Natural History Society for the year 1900. Pp. 74. London Institution, E.C. 1901.

The entomological papers are:—"Secondary sexual characters in British Coleoptera," by Mr. H. Heasler"; "Re-classification of the Lepidoptera," by Mr. W. J. Kaye; "A few Days at Fusio," by Dr. T. A. Chapman (with notes on the Geometrids by Mr. L. B. Prout). A further instalment of the lepidopterous "Fauna of the London District," bringing the subject up to the end of Geometridæ, is also given. The President's address, it must be added, is exceedingly interesting reading, and we heartily commend it to the notice of those who are not, as yet, students in the advanced school of entomology. The various matters referred to in the "Reports of Meetings" are of the usual instructive character.

LEPIDOPTERA.—A. G. MAYER carried 449 cocoons of *Callosamia promethea* from Massachusetts to Loggerhead Key (off the Florida coast, many hundred miles south of the southernmost range of the species), and experimented on the way in which the emerged females attract the males. Males do not come to females in hermetically sealed glass boxes, though they congregate about boxes which do not admit of a sight of the female, but which allow odours from the female to escape to the outer air. They will seek out such boxes even when the vapour of carbon bisulphide is escaping from the box, together with such odorous material as the female may produce. Females thirty to sixty hours old are much more attractive to males than young females five to ten hours old. Virgins are somewhat more attractive than fertilized females of the same age. The sense-organs thus stimulated are the antennæ, for when these are covered with impervious materials, the males no longer seek the females. If the eyes of a male are covered over with Brunswick black to prevent sight, he will still mate normally if placed near a female. The wings of the females are reddish blue, those of the males darker; yet, if these be interchanged (by means of glue), no apparent disadvantage in mating is suffered by either. These and other similar observations lead the author to conclude that the sexes pay no attention to the appearance of their partners, and that the dark colouration of the male has not been brought about through sexual selection on the part of the female.—"On the Mating Instinct in Moths," 'American Naturalist,' 1900, pp. 674-5, ex 'Psyche,' ix. (1900), pp. 15-20.



W. J. Lucas del.

West, Newman photo.

Tetrix bipunctatus. 1. Dorsal view. 1a. Lateral view. $\times 4\frac{1}{2}$.
Tetrix subulatus. 2. Dorsal view. 2a. Lateral view. $\times 4\frac{1}{2}$.

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ORTHOPTERA IN 1900.

BY W. J. LUCAS, B.A., F.E.S.

(PLATE III.)

DURING 1900 little of importance seems to have been done or observed in connection with the British representatives of the Orthoptera, and were it not that records in connection with this order are few, it would be out of place to publish the following brief notes of my own, especially as my work in the order during the year was very spasmodic. In all, or nearly all, the other orders new species have been added to the British list, but the total of the Orthoptera remains unchanged; perhaps no more are left to be discovered.

Among the **Earwigs**, Mr. Ashdown again found *Forficula lesnei* common in the old locality in the neighbourhood of Rammore, in Surrey. There was, of course, no dearth of *F. auricularia*. On Sept. 16th, one beaten from a tree on Esher Common, about 10.30 a.m., had apparently just cast its last skin, and was of a uniform pale creamy-white tint, except the eyes, which were black, and a little dark cloudiness in one part of the abdomen, due apparently to the contents. The insect, which was a male, had practically assumed its correct colouring by the evening.

As regards the **Cockroaches**, females of *Ectobia lapponica* were taken at sugar on Aug. 7th and Aug. 11th at Ramnor, in the New Forest; the little *E. panzeri* was found, and seemed to be common, at the sandhills near Studland in Dorset; and on Sept. 26th a specimen of *Rhyparobia maderæ* was received alive and in good condition from Mr. South, who received it on the night of Sept. 25th from Mr. H. O. Dixon, the latter stating that he found it "in his desk at Covent Garden the previous evening." The insect is now in my possession.

Turning to the grasshoppers with short antennæ (**Acridiodea**), *Mecostethus grossus* was again found in the New Forest, and at Denny Bog on Aug. 7th one or two females were very large. *Stenobothrus lineatus* was taken on Aug. 8th near Studland, in Dorset, and on Aug. 18th between Lulworth and Weymouth. *S. viridulus* was secured in the New Forest on Aug. 1st and 13th. The very common and variable species, *S. bicolor*, was noted in the New Forest, and by the coast near Milton, in Hampshire; near Studland and Portland, in Dorset; at Chilswell Hill, in Berks; at Esher Common and near Oxshott and Claygate, in Surrey. On Esher Common a large female was taken as late as Nov. 4th. The almost equally common *S. parallelus* was noted in the New Forest and near Oxshott. The better species, *S. rufipes* and *S. elegans*, I did not meet with. *Gomphocerus maculatus* was taken in several places, but *G. rufus* was not found. The little *Tettix bipunctatus*, which hibernates in the perfect form, was met with on May 19th at Oxshott, early in June in the New Forest, and on August 11th on the coast near Milford, in Hampshire. With the last amongst the fallen cliffs I also took its less common congener, *T. subulatus*, which I had not previously captured. As these two grasshoppers are by description somewhat alike, and, owing to their very diminutive size, no doubt often overlooked, figures of their dorsal and lateral aspect are given on Plate III. for comparison. Both are unique amongst British grasshoppers in having the pronotum produced posteriorly so as to cover the dorsal surface. With regard to *T. bipunctatus* should be noticed its stouter build; the two black spots on the pronotum, which, however, may be indistinct or absent; the diminutive wings, and the backward prolongation of the pronotum extending not quite to the knees. *T. subulatus* is more slender, does not possess the black spots; has better developed wings, and has the prolongation of the pronotum produced considerably beyond the knees.

Of the division of the grasshoppers with long antennæ (**Locustodea**), *Leptophyes punctatissima* was met with on several occasions in the New Forest, and was there perhaps more common than usual last season. Being wingless, it must either be picked off the herbage, if its colour will allow it to be discovered, or else taken with the sweeping net. To preserve the beautiful green colouring the abdomen must be emptied, and its contents replaced by a tiny roll of cotton-wool. In fact, the same must be done with all the Locustodea and the larger Acridiodea. *Meconema varium* was taken on Oct. 7th from a fence in Kingston-on-Thames. *Xiphidium dorsale* was again taken at Hengistbury Head, in Hampshire. On Aug. 8th, at the sandhills near Studland, in Dorset, an immature specimen was observed to be extremely well protected on a blade of grass, where it rested with its legs stretched out in a line with its body

in some such manner as many of the long-legged spiders do; such a position it took up very readily. This grasshopper seems always to affect the same kind of grass—a soft pale green species that grows in great tufts. On the evening of Aug. 7th, in one of the rides at Ramnor in the New Forest, I found some numbers of the singular wingless grasshopper, *Thamnotrizon cinereus*, one or two taken being still immature. After being killed (as was supposed), eviscerated, and set, two were found after several hours to be alive as regards the fore part of the body—a striking instance of vital tenacity. On Aug. 13th, near Rhinefields, a very large female of the same species was captured. On a broken piece of cliff-side between Lulworth and Weymouth, I took, on Aug. 18th, two females of *Platypleis grisea*, this being my first capture of the species, which is not, I believe, a specially scarce one, and is certainly conspicuous. *P. brachyptera* was, as usual, plentiful at the end of the summer on Esher and Oxshott Commons.

Of the **Grillodea** (Crickets), the only species that I met with was *Nemobius sylvestris*, which was found in several distinct districts in the New Forest, its only British home. No doubt it is well distributed there, its favourite haunts appearing to be amongst dead leaves on the banks of streams, but well up above the water.

Kingston-on-Thames: May, 1901.

LIFE-HISTORY OF COLIAS HYALE.

By F. W. FROHAWK, M.B.O.U., F.E.S.

(Continued from 'Entomologist,' vol. xxv. p. 274, 1892.)

FROM the observations I carried out respecting the earlier stages of *Colias hyale* in 1892 and 1893, I then felt convinced that this species hybernated in the larval condition, as stated in the 'Entomologist,' 1893, vol. xxvi. p. 146. I am now able to verify this to be the case from observations made during the past eight months upon a very large number of *C. hyale* larvæ possessed by friends and myself, and by their assistance I have been able to complete the life-history of this most interesting species.

The large number of larvæ I had last autumn, which hatched from the ova at the end of August, were all subjected to a high temperature with much sunshine during September; but, notwithstanding, they grew very slowly, and towards the end of the month they ceased feeding and entered into hibernation, being then quite small, the majority measuring about $\frac{1}{4}$ in. long. On December 21st I placed many of them in the sun,

it being a bright warm day with a sun temperature of 73° , but they all remained motionless. On the 3rd of January, with a shade temperature of 48° , I observed one larva feeding slowly; from that date others occasionally fed. On January 17th those from ova deposited on September 12th began crawling about in search of fresh food. The plants having only a few living leaves, I removed forty of the larvæ on to a fresh plant with a good supply of young leaves; they all crawled up the stems and rested on the petals, mostly on the under side, but they did not commence feeding until the 20th, when I noticed several feeding, and again on the following day, when it turned warmer, the outdoor shade temperature at 11 a.m. being 52° , and indoors 60° , where the larvæ were kept. It apparently is the usual habit of the larvæ of *hyale* to leave their hybernaculum about the middle of January in their more southern home, as those I had in 1892 did the same. February 12th was a cold, almost cloudless day after a very cold early morning of 22° , but a slight haze prevented much warmth from the sun, as the temperature in the sun did not rise above 54° where the larvæ were, but for the want of more heat they remained nearly motionless all day.

In the continuous dull weather during February and March the larvæ were kept near a fire during the daytime, but from the dullness of the weather they showed little signs of activity, and fed but slightly; but from 5 to 11 p.m. nightly they were placed on a chimney-piece over a fire and directly under a gaslight, which appeared to suit them admirably, as they became active and fed on and off all the time, yet they made but slow progress, although a few moulted for the third time, and they all gradually died, the last one dying on March 16th, having lived for about two hundred days. I was so far enabled to figure and describe the larva after the third moult—description presently.

I will now allude to another brood of *hyale* larvæ, which Messrs. Cope and Hawkins had under observation, from ova obtained the middle of August last. They all commenced hybernating during September, and at the end of that month the plants containing the larvæ were placed in a greenhouse, which was kept at a moderately warm temperature throughout the winter, the night temperature not going down below 44° . These were left untouched until the third week of February, when my friends found forty still living, the majority of them having moulted the third time. They made satisfactory progress until many had reached their last stage, when they gradually died off, and only one succeeded in pupating on March 6th, which, however, was slightly malformed, and produced a crippled yellow female on April 4th.

On March 18th Mr. W. A. Cope kindly gave me, for the purpose of figuring, the last remaining larva, almost full grown, which I figured the following day, when it measured just an inch in

length. It finally became fully grown on April 6th, and measured one and one-sixth inch long, but died the following day.

To Mr. J. H. Carpenter my especial thanks are due, as with his assistance I have been able to complete the life-history of this species. He obtained a large number of ova from a female captured at Sheerness on August 18th last. The larvæ started hybernation at the same time as those of all the others we had under observation, when fortunately he placed them all (between two hundred and three hundred) in a store room which, from its situation, remained at a fairly uniform temperature throughout the winter; during the coldest nights it did not go below about 42°. The plants on which the larvæ were confined were kept near a window, and were unattended to all through the winter, consequently the plants dried up, which evidently is the cause of the success he has attained with them, which he says is due more to accident than otherwise, as he had but slight hopes of pulling them through, so left them unattended. From the result of our observations, it appears that it has been the moisture from the mould in the pots containing the living plants, which were kept watered through the winter, that caused so much fatality with Messrs. Cope's, Hawkins's, and my own larvæ. As the temperatures mine were subjected to until the end of January were almost similar to those in Mr. Carpenter's possession, it therefore seems evident that it is during hybernation that they require dryness, and to be kept from frost. After hybernation my friend had about two hundred larvæ living; but many of them died subsequently, no doubt from being exposed to a few (two or three) degrees of frost, coupled with the dampness then arising from the freshly potted plants. He has, however, met with so much success that, at the time of writing, he now has over one hundred pupæ. When I examined his larvæ on March 9th, I found they were in the same stages as those I had. On April 24th I again visited him, and found he had about one hundred and twenty larvæ, many about full grown, and a couple of pupæ; the first one pupated on April 20th. This and some larvæ he very kindly gave me (from this pupa a male emerged on May 7th). With this aid I have completed figuring and describing the final stages of this butterfly.

As all the earliest stages from the deposition of the egg to second moult inclusive, I published in the 'Entomologist, 1892, vol. xxv. pp. 271-274, I will now continue with the various remaining stages—from larvæ which hatched on August 29th, 1900, from ova deposited August 19th. The hybernation stages are after the second and third moults.

After the third moult when hybernating and one hundred and eight days old, it measures $\frac{6}{19}$ in. long; colour uniformly green, the spiracular line whitish green, dilated and divided into four lobes of unequal sizes; on the second one, which is the largest, is placed

the large conspicuous shining black spiracle ; on the adjoining posterior lobe is a primrose-yellow oblique blotch ; each segment is transversely and deeply wrinkled, the centre one so much so that it gives each segment a double appearance. The entire surface is densely sprinkled with black shining warts of various sizes, some extremely minute, each one emitting a black shining bristle ; these are straight on the dorsal surface, and rather curved on the lateral region, all being directed in various positions. The head, legs, and claspers are similar to the body, all being covered with bristles, and of a green colour. The body is also extremely finely granulated with the minutest black specks, principally on the dorsal area ; these, together with the black bristles, give the larva a dark green colour and a rough appearance. From this stage the large black spiracles become less conspicuous.

After hybernation and after third moult—over one hundred and sixty days old—it measures $\frac{1}{2}$ in. long ; the whole colouring clearer and lighter than during hybernation ; the head ochreous-olive, and the spiracular line pale lemon-yellow.

About a week after the fourth moult—two hundred and twenty days old—it measures $\frac{3}{4}$ in. long ; the general colouring and form almost exactly similar to the previous stage, excepting the spiracular line is rather whiter, and in some specimens the yellow markings on the line are faintly shown ; the spiracles in most cases are less black, having whitish centres, and the head is generally ochreous tinged with green, but some have almost clear green heads.

After fifth and last moult—fully grown—it measures $1\frac{1}{4}$ in. long ; is almost cylindrical but slightly largest at the third segment, and tapering at the anal segments. The ground colour is a clear light green, but has a darkish velvety appearance, due to the entire surface being densely sprinkled with black warts, each emitting a moderately long bristle, which are black all over the dorsal surface, and white on the ventral surface ; each wart is encircled with whitish green, and the intervening spaces have excessively minute black granulations ; the spiracular line is tricoloured, having a white upper border running the whole length, the anterior half on each segment is a beautiful rich lemon-yellow reaching just beyond the spiracle, then deepening into orange-vermilion, which fades into orange posteriorly ; the spiracle is white, very finely outlined with black. The head, claspers, and legs are green, and covered with bristles similar to the body.

There is considerable variation in the colouring of the spiracular line ; in some specimens the orange-vermilion is replaced by deep gamboge-yellow, and a remarkable variation occurs in some specimens by having a conspicuous black spot immediately below the spiracular line, precisely similar to *edusa* ; in some

these spots occur from the third to the eleventh segments inclusive; in others it is only on a few of the segments, while others have no trace whatever of them; but usually, when they do occur, they are not so large as in *edusa*. The similarity between the larva of the two species is remarkable, and the only differences which I can detect are as follows:—In *hyale* the black spots below the line are usually less in size, also in number, or altogether absent; the red of the spiracular line extends further, and that the bristles are somewhat darker and longer than those of *edusa*.

The pupa: the length varies from $\frac{1\frac{3}{8}}$ to $\frac{7}{8}$ in., and $\frac{1}{4}$ in. in greatest diameter; the head terminates in a short straight beak, the thorax is humped dorsally, the abdomen rounded and tapering to the anal point; wings ample, rounded and swollen in the middle, reaching the division between the fifth and sixth abdominal segments, base of wings angular; dorsal half of head dark green, ventral half light green, the two shades being divided by a light greenish yellow stripe, which extends along the inner submargin of the wing and spiracular line, enclosing the inconspicuous whitish spiracles. The whole of the dorsal surface varies from pale green to light greenish yellow, in some specimens it is decidedly yellow; there is a medio-dorsal longitudinal line rather darker than the ground colour. The wings are of a duller and darker green, as are the legs and antennæ. The ventral surface of the abdomen is of the same yellow-green as the dorsal surface. The inner margin of the wing is dusky green, which borders on the submarginal yellow line. A subspiracular series of three minute black dots on the abdomen, and below these a lateral dark purplish brown band composed of four oblong markings, one on each segment from the wings downwards, the last being very pale and small. On the wing a sub-hind-marginal series of six black dots, each situated between the nervures and a central black discal dot. It is suspended by a belt of silk round the middle, and the attachment of the anal hooks to a silken pad spun upon the stem of the plant.

The resemblance between the pupa of *hyale* and *edusa* is almost identical, the only differences which appear to be constant are that the head beak of *hyale* is straight, which in *edusa* is slightly upturned, and the apex of the wing in the latter does not reach so far down the abdomen as in *hyale*.

The first specimen, a male, emerged on May 7th, 1901.

Croydon: May 11th, 1901.

ON LABELLING INSECTS.

By E. BRUNETTI.

THERE is a great lack of uniformity in labelling insects, owing to which it is often impossible to distinguish the name of the locality from that of the collector; and with reference to the date of capture, it is impossible to discover what is meant (when the day of capture happens to be less than the 13th) on account of some collectors placing the day of the month first, and others the month.

For instance, a specimen taken on May 10th, 1901, would by some be labelled 10.5.1901, and by others (chiefly amongst Americans) 5.10.1901. On passing from one collection to another, the recipient would be undecided as to whether the figures referred to May 10th or October 5th.

Again, now that exchange abroad is much more common than formerly, it is insufficient to give simply the village or wood in which the insect is taken.

The province or county should also be given, in full if possible, unless the name of the country be also added, when both the latter may be abbreviated; as, for example, "Bradford, Yorks., Eng.," or "Shovel Mount, Burnet Co., Tex."

It must be remembered that there are counties of Middlesex, Surrey, and Cornwall in Jamaica; that there are similar instances everywhere, and hosts of towns with well-known English names in the United States, in Canada, and other colonies; so that specimens so ambiguously labelled as "London," "Victoria," &c., might give rise to much confusion in general collections.

I have the honour, therefore, to propose the following system of labelling all insects:—

1st.—The exact locality to be given in full, invariably including county (or province) also, such as "Bognor, Sussex." "Admont, Styria." "Palm Beach, Florida."; or, if the county's name be abbreviated, the country also to be added, as "Bradford, Yorks., Eng."

2nd.—The date to be invariably given in the following order: day, month, year; and, to further avoid misunderstanding, the month to be given in roman numerals; thus, May 10th, 1901, should read 10.v.1901.

3rd.—The collector's name (if added) to be always placed sideways to the rest of the inscription, and the ticket to be attached to the insect, so that it may be read from the right hand side of the specimen. Examples:—

| | |
|----------|--------------------|
| BRUNETTI | <i>New Forest,</i> |
| | <i>Hants, Eng.</i> |
| | 16. vi. 1901 |

| | |
|--------|--------------------|
| CROSBY | <i>Lake Keuka,</i> |
| | <i>New York.</i> |
| | 14. viii. 1901 |

The scientific value of collections thus uniformly labelled would, I think, be increased, and reference, at least, much facilitated.

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A PRELIMINARY LIST OF THE LEPIDOPTERA OF WEI-HAI-WEI.

BY THOMAS BAINBRIGGE FLETCHER, R.N., F.E.S.

(Continued from p. 156.)

Fam. PIERIDÆ.

Sub-Fam. PIERINÆ.

Pieris rapæ, L.—Common all the summer near cultivated ground round the villages. They seem mostly referable to var. *orientalis*, Oberth.; the females as a rule have the basal black markings much developed (var. *crucivora*). I noticed that on wet days they often settle on willow-leaves, evidently selecting these because they are of a light tint, and match the under surface better than would most other leaves.

Pieris canidia, Sparrm.—Common in May.

Pontia daplidice, L.—Common all the summer; there seem to be two emergences, one in May and the other in August, but the species is to be found all through the warm season. It has a decided preference for a sandy beach overgrown with a small *Convolvulus*.

Sub-Fam. CALLIDRYINÆ.

Eurymus (Colias) hyale, auct. (= *kirbii*, Lewis).—Common in April and May, and again from September until the cold weather sets in. A white form of the female is fairly common. These Wei-hai-wei specimens agree best with var. *elwesii*, Butl., of the form (? sub-species) *poliographus*, Mots.

Terias anemone, Feld., var. *mariesii*, Butl.—One specimen; Leu-kung-tao, 4th September, 1898.

Fam. EQUITIDÆ.

Sub-Fam. EQUITINÆ.

Jasoniades (Papilio) xuthus, L.—I only met with this species on one occasion, on 28th August, 1898, when it was common in Leu-kung-tao along the hills. This would be the second brood. In Japan, I have taken the first brood (var. *xuthulus*) at Nagasaki in April, but have not seen it at Wei-hai-wei.

Achivus (Papilio) machaon, L.—Fairly common, especially round hill-tops at an elevation of from five hundred to a thousand feet. There are two emergences, the first appearing at the beginning of May, the second about the middle of August. The spring brood is typical *machaon*, the æstival is decidedly var. *asiatica*, Mén.; it is, however, of normal size, and does not approach the large form *hippocrates*, Feld.

Papilio sp.—There is a third Equitid to be found at Wei-hai-wei, but I cannot vouch for the species. One day in July, 1898, I saw a large black *Papilio* flapping about around the top of Centurion Hill, but failed to secure it.

Fam. HESPERIIDÆ.

Sub-Fam. HESPERIINÆ.

Hesperia (Syrichthus) maculatus, Brem.—Fairly common at the end of April and beginning of May.

Hesperia (Syrichthus) sinicus, Butl.—Two specimens; Leu-kung-tao, 23rd July, 1898.

Thanaos (Nisoniades) montanus, Brem.—Common on the mainland amongst oak-bushes on 25th April, 1899, but very local. Pryer states that the larva feeds on oak, and this is probably correct, as I have always found this species associated with oak, both at Wei-hai-wei and Nagasaki.

Sub-Fam. PAMPHILINÆ.

Pamphila guttata, Brem.—Common in July and August, and stragglers remain on the wing until October.

Pamphila sinensis.—One female taken in July, 1898, by Mr. Ph. de la Garde. It is much larger than the average.

HETEROCERA.

Fam. ZYGÆNIDÆ.

Northia trista, Brem.—Seems fairly common on the hills of the mainland, 20th May and 13th June, 1899. The flight is rather weak and "booming."

Syntomis phegea, L., var. *nigricornis*.—Common in June; abundant in 1898, not so common in 1899. There is a good deal of variation in the size of the white spots, especially on the hind wings. The form found here is much smaller than the European type, and constantly differs in wanting the characteristic white tips to the antennæ. Sir George Hampson (Cat. Lep. Phal. B.M., vol. i. p. 110) calls this an aberration, but here it is rather a true variety replacing the type. The larva is common in May, and is to be found on low plants and under stones.

Fam. LIPARIDÆ.

Caviria sericea, Moore.—Common at the end of June. The larva feeds on willow in May.

Euproctis varians, Walk. (= *pusilla*, Moore).—One specimen, bred 2nd July, 1899, from a larva found in Leu-kung-tao on 10th June. The larva recalls that of *S. phegea*, and is found in the same sort of locality. The cocoon is flimsy, and interwoven with larval hairs.

Porthetria dispar, L.—Abundant. The larvæ, which appear to be polyphagous, are to be seen in thousands during May, and are full-fed about the beginning of June. The moth appears in July.

Fam. PSYCHIDÆ.

Metisa aurea, Butl.—One male, bred 7th July, 1899, from a larva found on willow on the mainland on 20th June. There are four males in the National Collection, including the type; two of these are from Yokohama, and two from Pryer's collection, Japan.

(To be continued.)

THE LEECH COLLECTION PRESENTED TO THE NATION.

THE National Collection of Lepidoptera located in the Natural History Museum at South Kensington has recently been greatly enriched by the addition thereto of the almost unique collection of Butterflies from Europe, and Central and Eastern Asia, together with the collection of European Moths, formed by the late John Henry Leech, Esq., of Hurdcott House, Salisbury (see Biographical Notice, *ante*, p. 33).

Arrangements had been made during Mr. Leech's lifetime under which the Museum became possessed of his Eastern Asian Moths, and now the same public institution has acquired the still more important accessions adverted to, through the munificence of his mother, Mrs. Leech, of Kensington Palace Gardens. No more fitting memorial of the eminent entomologist, whose early removal we greatly deplore, could have been devised than that the collection which had afforded him so much pleasure in amassing, and which furnished him with considerable valuable material for faunistic and descriptive work, should find a permanent home in the Museum of his own country. It would have been most regrettable if this magnificent collection had been broken up, and its component parts distributed over the face of the globe—a fate it would probably have met with except for the kind interest in the matter shown by Mrs. Leech, who, it may be added, had at all times encouraged her son in his entomological studies. We have, therefore, very great pleasure in tendering our most sincere thanks to the generous donor for her valuable gift to the nation, and in doing this we can but feel assured that we are giving expression to the feeling of all British entomologists.

We understand that the Museum authorities will publish a Catalogue of the Butterfly collection, so that it is perhaps only necessary to mention here that of Rhopalocera there are rather more than eighteen thousand specimens, representing some eleven hundred species, among which are over four hundred male and female types of species described by Mr. Leech. This collection of Palæarctic butterflies is very rich in Chinese and Japanese species, and in local forms and aberrations of European species. The European Heterocera number about twenty-three thousand specimens, including some fine aberrations and extensive series of the variable species. The collection of Eastern Asian Moths, from which the Museum had already made a selection, comprised nearly three thousand species, of which about eight hundred were made known to science by Mr. Leech.

ON THE NOMENCLATURE OF THE GENERA OF THE RHYNCHOTA, HETEROPTERA AND AUCHENORRHYNCHOUS HOMOPTERA.

By G. W. KIRKALDY, F.E.S.

(Continued from vol. xxxiii. p. 265.)

1827. CURTIS, Brit. Ent. [Feb. 1st] 154. (a) *Dictyonota* t. *eryngii*, nec Latr.¹

1828-30. HEINECKEN, Zool. Journ. v. 35-40. (a) *Cerascopus*² t. *marginatus*.³

1829. LATREILLE in Cuv. Règne An. (Masson's), iii. 27 et seqq. (β) *Dinidor*, *Heteroscelis*, *Cicadella*; ⁴ *Ciccus*; *Bocyidium*; *Tragopa*. (δ) *Gonocerus*, *Syromastes*, *Anisoscelis*, *Nematopus*, *Leptocorisa* (1825), *Cælidia*, 1821; *Eulopa*, 1814; FALLEN, Hem. Svec. 1-186. (a) *Sciocoris* t. *umbrinus*.⁵ (β) *Bryocoris*; SCHILLING, Beitr. Ent. Schles. i. 34-93. (a) *Platynotus*⁶ t. *apterus*. (β) *Rhopalus*,⁷ *Platygaster*; ⁸ *Ophthalmicus*,⁹ *Heterogaster*; STEPHENS, Nomencl. Brit. Ins. 64-8. (δ) *Ploa*, 1818 [*Kleidocerys*, *Planthisus*, *Hylophila*, *Orthonotus*, *Pæcilosoma*, *Azinecera*¹⁰].

1830. GERMAR, Thon's Ent. Arch. ii. 1-8, 45-57. (β) *Amphiscepa*; CURTIS, Brit. Ent. [Feb. 1st] 297. (a) *Chorosoma* t. *arundinis*; ¹¹ KLUG, Symb. Phys. (a) *Blissus* t. *hirtulus*; *Pachynomus* t. *picipes*; *Amphibolus* t. *venator*. (β) *Oncocephalus*, *Opsicætus*,¹² *Eumerus*; ¹³ GUERIN, Duperrey's Voy. Coquille, Zool. ii. pt. 2, 165-93. (a) *Scutiphora* t. *picta*; ¹⁴ *Agapophyta* t. *bipunctata*; *Leptoglossus* t. *dilatocollis*; *Ugyops* t. *percheroni*. (β) *Platycoris*, *Megymenum*, *Aphæna*; [*Eurybrachys*, nec descr.].

1830 (?). *HERRICH-SCHAFFER, Panz. Faun. Germ. Fortz. 135. (a) *Cryptostemma* t. *alienum*.

1831. SERVILLE, Ann. Sci. Nat. xxiii. 213-22. (β) *Peirates*; J. E. GRAY, Miscell. 34. (a) *Ptilocerus*¹⁵ t. *fuscus* [HAHN, Wanz. Ins. i. 1-36 [Feb.]] (β) *Cerbus*, *Oriterus*, *Lopus*, *Largus*, *Dicranomerus*, *Phylus*, *Polymerus*, *Apiomerus*, *Loricerus*, *Arilus*, *Cimbus*, *Aptus*.]¹⁶

1832. *SAY, Het. Hem. Indiana, p. 8. (a) *Ascra*¹⁷ t. *bifida*; *SAY, Het. Hem. Indiana, pp. ? (a) *Ptochiomera* t. *nodosus*, *Cylapus* t. *tenuicornis*. (β) *Pamera* n. n. for *Pachymerus*, 1825 [male *Pachy-*

¹ = *strichnocera*, Fieb.

² Homotyp. *Ploiaria*, 1787.

³ = *domestica*, Scop.

⁴ Co-extensive with several previously described genera, there used as subgenera.

⁵ = *terreus*, Schranck.

⁶ Homotyp. *Pyrrhocoris*, 1814.

⁷ = *Corizus*, 1814.

⁸ Preocc. Latr. 1809.

⁹ = *Geocoris*, 1814.

¹⁰ All undescribed, and to me invalid.

¹¹ = *schillingi*, Schilling.

¹² = *Reduvius*, 1775.

¹³ Preocc. Meig. 1822.

¹⁴ = *pedicellata*, Kirby.

¹⁵ Preoccupied.

¹⁶ These twelve genera are to me invalid, not being described.

¹⁷ = *Edessa*, 1803.

mera]. (δ) *Corixia*, 1762; BRULLE, Comm. Sci. Morée Ins. 68-80. (δ) *Oelia*, 1803; LAPORTE, Ann. Soc. Ent. France, i. 95-8. (β) *Heteronotus*; HAHN, Wanz. Ins.] Aug.] i. 37-80. (β) *Cymus*. (γ) *Heterogaster*, 1829, t. *urticæ*; [Nov.] i. 81-118. (α) *Myrmus* t. *miriformis*; Jalla t. *dumosa*; *Halticus* t. *pallicornis*; ¹⁸ *Attus* ¹⁹ t. *pulicarius*. (β) *Arma*; *Rhynarius*; ²⁰ LAPORTE, Ann. Soc. Ent. France, i. 221-31. (α) *Poiocera* t. *luczoti*; *Germaria* ²¹ t. *cucullata*; ²² *Schizia* t. *servillei*; *Atypa* t. *gibba*; *Pterygia* ²³ t. *macquarti*; *Sphæronotus* ²⁴ t. *globularis*; *Cyphonia* t. *ornata*. ^{24a} (β) *Acanthicus*; ²⁵ PERCHERON in Guérin's Mag. Zool. pl. 48, pp. 1-2. (α) *Cephalelus* t. *infumatus*. (δ) *Cicus*, 1829; WESTWOOD in Gray's Griffith's Cuvier's An. Kingd. xv., Ins. ii. 216-64. (α) *Urophora* ²⁶ t. *hardwickii*; *Orthorapha* t. *cassidioides*; LAPORTE, Ann. Soc. Ent. France, i. 386-415. (α) *Raphirhinus* t. *adscendens*; ^{26a} LAPORTE, Mag. Zool. i. Suppl. 1-88. (α) *Harpactor* t. *angulosus*; ²⁷ *Prionotus* ²⁸ t. *serratus*; ²⁹ *Hexatoma* ³⁰ t. *marginalis*; ³¹ *Leptomeris* t. *picta*; *Macrophthalmus* ³² t. *pallens*; *Triatoma* ³³ t. *gigas*; ³⁴ *Lophocephala* t. *guerini*; *Prostemma* ³⁵ t. *guttula*; *Discomerus* ³⁶ t. *erosa*; *Mononyx* t. *raptoria*; *Diplonychus* t. *rustica*; ³⁷ *Sphærodema* t. *rotundata*; *Stenopoda* t. *cinerea*; ³⁸ *Micrelytra* t. *apterus*; ³⁹ *Meropachus* t. *nigricans*; *Pachymeria* ⁴⁰ t. *armata*; *Acanthocephala* t. *compressipes*; ⁴¹ *Leptoscelis* t. *hæmorrhoidalis*; *Microtoma* ⁴² t. *echii*; *Næogeus* t. *erythrocephalus*; ⁴³ *Aphanus* t. *roland[r]i*; *Eurycephala* t. *luteicollis*; ⁴⁴ *Odonotopus* t. *sempunctatus*; *Meganotus* ⁴⁵ t. *apterus*; *Stenodema* t. *virens*; *Menenotus* t. *lunatus*; *Hymeniphera* t. *crucifer*; *Chariesterus* t. *gracilis*; ⁴⁶ *Chondrocera* t. *laticornis*; *Atractus* ⁴⁷ t. *cinereus*; *Phyllo-morpha* t. *histris*; ⁴⁸ *Zosmenus* ⁴⁹ t. *maculatus*; *Eurycera* ⁵⁰ t. *nigricornis*; ⁵¹ *Pedeticus* t. *marmoratus*; ⁵² *Piestosoma* ⁵³ t. *depressus*; *Brachyrynchus* t. *orientalis*; ⁵⁴ *Dryptocephala* t. *brullei*; *Disco-*

¹⁸ = *apterus*, Linn.

¹⁹ Preocc. Walck. 1805.

²⁰ = *Anthocoris*, 1814.

²¹ Preocc. Desv. 1831.

²² = *marmorata*, F.

²³ Preocc. Boit. 1798.

²⁴ = *Bocydium*, 1829.

^{24a} = *trifida*, Fabr.

²⁵ Preocc. Spin. 1829 [nymph-stage of Centrotine genus].

²⁶ Preocc. Desv. 1830.

^{26a} = *phosphorea*, Linné.

²⁷ By error *angulatus* (see p. 88).

²⁸ Preocc. Lacép. 1802.

²⁹ = *carinatus*, Forst.

³⁰ Preocc. Latr. 1809.

³¹ = *tipuliformis*, Fab.

³² Preocc. Latr. 1829.

³³ Altered invalidly on p. 77 to *Conorhinus*.

³⁴ = *rubrofasciatus*, De Geer.

³⁵ Homotyp. Nabis, 1802.

³⁶ Homotyp. *Syrtris*, 1803.

³⁷ On p. 83 *rustica* is said to be a *Sphærodema*.

³⁸ = *culiciformis*, Fabr.

³⁹ = *fossularum*, Rossi.

⁴⁰ Preocc. Steph. 1829.

⁴¹ = *latipes*, Drury.

⁴² Altered invalidly on p. 84 to *Polyacanthus* (the last preocc. Kuhl, 1831).

⁴³ = *pusillus*, Fall., var.

⁴⁴ = *atrata*, Goez.

⁴⁵ Homotyp. *Pyrhocoris*, 1814.

⁴⁶ = *armatus*, Thunb.

⁴⁷ Preocc. Wagl. 1828.

⁴⁸ = *laciniata*, De Vill.

⁴⁹ = *Piesma*, 1825.

⁵⁰ Homotyp. *Copius*, 1822.

⁵¹ = *cornutum*, Thunb.

⁵² = *fasciata*, H.-S.

⁵³ = *Aradus*, 1803.

⁵⁴ = *membranaceus*, Fabr., var.

cephala t. *marmorea*; *Phyllocephala* t. *senegalensis*; *Aspongopus* t. *janus*; *Oncomeris* t. *flavicornis*; *Eurydema* t. *oleracea*; *Brachystethus* t. *marginatus*; ⁵⁵ *Elusthenes* t. *robusta*; *Atelocera* t. *armata*; *Megarhynchus* ⁵⁶ t. *elongatus*; ⁵⁷ *Odontotarsus* t. *purpureolineatus*; ⁵⁸ *Eurygaster* t. *hottentota*; ⁵⁹ *Trigonosoma* t. *nigellæ*; ⁶⁰ *Agonosoma* ⁶¹ t. *flavolineata*; *Calidea* t. *signata*; *Podops* t. *inuncta*; *Coptosoma* t. *globus*; ⁶² *Platycephala* t. *metallica*; *Oxynotus* ⁶³ t. *gibba*; *Odontoscelis* t. *fuliginosa*; *Hammacerus* t. *conspicillaris*; *Cimbus* ⁶⁴ t. *versicolor*; *Platymenis* t. *biguttatus*; *Tapeinus* t. *pictus*; *Apionomerus* ⁶⁴ t. *hirtipes*. ⁶⁵ (β) *Euryophthalmus*; *Spartocera*; *Rhaphigaster*; *Discocera*; *Stiretrus*; *Opinus*; ⁶⁶ *Graphosoma*; *Lasiocera*. ⁶⁷ (γ) *Halobates*, 1822, t. *micans*; *Pachylis*, 1825, t. *pharaonis*; *Anisoscelis* [recte *Anisoscele*], 1825, t. *foliaceus*; *Stenocephalus* [recte *Stenocephale*], 1825, t. *nugax*; *Nematopus* [recte *Nematope*], 1825, t. *nervosus*; *Leptocoris*a [recte *Leptocorise*], 1825, t. *linearis*; *Acanthocerus*, 1805, t. *sanctus*; *Monanthia*, 1825, t. *echii*; *Heteroscelis*, 1829, t. *servillei*; *Megymenum*, 1830, t. *dentatum*; *Peirates*, 1831, t. *stridulus*. ⁶⁸

1832-4. PERTY, Delect. 164-216. (α) *Scaptocoris* t. *castanea*; *Diactor* t. *elegans*; *Merocoris* t. *tristis*; *Platycoris* ⁶⁹ t. *varia*; *Storthis* ⁷⁰ t. *lividia*. ⁷¹

1833. CURTIS, Ent. Mag. [Jan.] i. 191-9. (α) *Eupteryx* t. *picta*; ⁷² *Amblycephalus* ⁷³ t. *viridis*; *Agallia* t. *consobrina*; ⁷⁴ *Megophthalmus* t. *bipunctatus*; ⁷⁵ *Phrynomorphus* t. *nitidus*; *Aphrodes* t. *testudo*; ⁷⁷ *Criomorphus* t. *albomarginatus*; *Galeatus* t. *spinifrons*; ⁷⁸ *Aspidotoma* ⁷⁹ t. *capitata*; *Pantilius* t. *tunicatus*; *Loricula* ⁸⁰ t. *pselaphiformis*; *Chlamydat* t. *marginatus*; *Hebrus* ⁸¹ t. *pusilla*. HAHN, Wanz. Ins. i. [Febr.] 119-58. (α) *Lopus* t. *hieracei*. ⁸² (β) *Lygus*. CURTIS, Brit. Ent. [May] 453. (α) *Coranus* t. *pedestris*. ⁸³ HAHN, Wanz. Ins. i. [June] 15-90. (α) *Ochetopus* ⁸⁴ t. *spinicollis*; ⁸⁵ *Strachia* t. *cruciger*. (β) *Hypselonotus*. GERMAR, Rev. Ent. i. 174-84. (α) *Phenax* t. *variegata*; *Oxyrhacis* t. *turandus*; *Paropia* ⁸⁶

⁵⁵ = *geniculatus*, Fabr.

⁵⁶ Preocc. Thunb. 1824.

⁵⁷ = *rostratus*, Fabr.

⁵⁸ = *grammicus*, Linn.

⁵⁹ = *fuscocucullatus*, Goez.

⁶⁰ = *rustica*, Fabr.

⁶¹ Preocc. Guérin, 1830.

⁶² = *scutellatus*, Fourer.

⁶³ Preocc. Raff. 1810.

⁶⁴ Usually ascribed to Hahn, 1831, q. v.

⁶⁵ *nigrilobus*, Stal.

⁶⁶ = *Tapeinus*, 1832.

⁶⁷ On p. 50 = *Holoptilus*, 1825.

⁶⁸ — *hybridus*, Scop.

⁶⁹ Preocc. Guérin, 1830; altered in 1834 to *Homalocoris*.

⁷⁰ Homotyp. *Dryptocephala*, 1832.

⁷¹ = *brullei*, Lap.

⁷² = *atropunctata*, Goeze.

⁷³ Homotyp. *Tetigonia*, 1762.

⁷⁴ = *puncticeps*, Germ.

⁷⁵ = *scanicus*, Fall.

⁷⁶ = *Aphrodes*, 1833.

⁷⁷ = *albifrons*, Linn.

⁷⁸ = *angusticollis*, Reut.

⁷⁹ Homotyp. *Piesma*, 1825.

⁸⁰ Preocc. Cuv. 1829.

⁸¹ Homotyp. *Næogeus*, 1832.

⁸² = *thunbergii*, Fall.

⁸³ = *subapterus*, De Geer.

⁸⁴ Homotyp. *Pygolampis*, 1817.

⁸⁵ = *denticulatus*, Germ.

⁸⁶ Homotyp. *Megophthalmus*, 1833.

⁸⁷ Preocc. Perty, 1830-2.

^{87a} = *bonellii*, Latr.

t. scanica. (β) *Stegaspis*; *Smilia*; *Hoplophora*; ⁸⁷ *Dictyophara*, *Bythoscopus*, *Acucephalus*, ⁷⁶ *Combophora*, *Hemiptycha*, *Entylia*, *Lamproptera*, *Typhlocyba*. (γ) *Bocydium*, 1829, *t. globularis*. (δ) *Ptyela*, 1825; *Smaris* for *Scaris*; WESTWOOD, Mag. Nat. Hist. vi. 228-9. (α) *Aphelocheirus t. æstivalis*; DUFOUR, Ann. Soc. Ent. France, ii. 104-18. (β) *Xylocoris*; LAPORTE, Ann. Soc. France, ii. 251-3. (α) *Caliscelis t. heterodoxa*; ^{87a} CURTIS, Brit. Ent. [Aug. 1st] 465. (δ) *Pyrrocheris*, 1814; HAHN, Wanz. Ins. i. [Sept.] 191-236. (α) *Leptocoris t. rufus*; ⁸⁸ ii. [Nov.] 1-32. (α) *Corecoris* ⁸⁹ *t. cinnamomeus*; *Colliocoris* ⁹⁰ *t. griseus*. ⁹¹ (β) *Rhynocoris*.

(To be continued.)

NOTES AND OBSERVATIONS.

SELENIA TETRALUNARIA (ILLUSTRARIA) IN SCOTLAND.—I see that Mr. C. G. Barrett, in his 'Lepidoptera of the British Islands,' with regard to *S. tetralunaria*, so far as Scotland is concerned, merely states that "In Dr. Buchanan White's 'List of Scottish Lepidoptera' this species is recorded as occurring at Rannoch, Perthshire, but no particulars are given, and confirmation seems desirable." I conclude from this that records of this species in Scotland are desired, and I have much pleasure in placing on record the fact that on April 25th this year I bred a fine male specimen from a larva taken by me last September near Dunkeld, Perthshire.—FRANCIS C. WOODBRIDGE; Northcroft, Cornwall Road, Uxbridge, Middlesex.

ZONOSOMA PENDULARIA IN OCTOBER.—At the end of October last I bred a specimen of *Z. pendularia* from a larva taken by me in the preceding August at Kingussie, Inverness-shire; I took other larvæ of this species at the same time as that which emerged in October, but the imagines from them have not yet appeared. Is it not somewhat unusual for *Z. pendularia* to appear in October? My pupæ are all kept in an outhouse, and the October specimen could not have been forced in any way.—FRANCIS C. WOODBRIDGE.

A CORRECTION.—The drawing that I exhibited at the meeting of the South London Entomological and Nat. Hist. Society on February 14th represented a variety of *P. bellargus*, and not of *P. icarus* as stated in the report of that meeting (*ante*, p. 134).—C. W. COLTHRUP, 127, Barry Road, East Dulwich.

THE PAIRING OF EUCHLOË CARDAMINES.—In a lane near here, a female specimen of *E. cardamines* was seen, settled and perfectly quiescent, on a flower-head of hedge-garlic mustard, when a male specimen, flying down the lane, made straight for the female, and pairing instantly ensued. A note was made of the occurrence, it being most unusual, in my experience, for butterflies to pair at such

⁸⁸ = *abdominalis*, Fabr.

⁸⁹ = *Spartocera*, 1832.

⁹⁰ Homotyp. *Coranus*, 1833.

⁹¹ = *subapterus*, De Geer.

short acquaintance, and with no previous courtship, and seems specially interesting in view of Prof. Meldola's experiences recorded *ante*, p. 128. R. M. PRIDEAUX; Reigate, Surrey, April 23rd, 1901.

THE BUFF VARIETY OF AMPHIDASYS BETULARIA.—I have lately been looking over some of the back volumes of the 'Entomologist,' and was much interested in the notes on pages 113 and 162 of vol. xxii. (1889), on the subject of the buff variety of *Amphidasys betularia*, which was bred in the Middleton district in the seventies, inasmuch as I have a specimen of this variety in my collection. This insect came to me through a dealer, who informed me that it was from the Manchester district, bred about 1878, and I think, after reading Mr. Thorpe's remarks (Entom. xxii. 163), that it is most probably one of those specimens formerly belonging to Jonathan Fielding, which Mr. Thorpe says he (Fielding) exchanged with a London dealer for foreign butterflies for "picture making." "Manchester district" would, I take it, include Middleton. As this form seems to have disappeared entirely for the last twenty years, it would seem desirable to place on record the existence of any specimens which remain.—H. AINSLIE HILL; 9, Addison Mansions, Kensington W., May 15th, 1901.

[I have a pair of this curious variety of *A. betularia*. They were formerly in Mr. Carrington's collection, and he, I believe, obtained them from a London dealer.—R. S.]

CAPTURES AND FIELD REPORTS.

NOTE ON VANESSA POLYCHLOROS.—On one of the last days of April this year I saw two specimens of *Vanessa polychloros* on Walton Heath, and two others near Betchworth; several others may or may not have been these over again. It is many years since I last saw this butterfly alive in England.—T. A. CHAPMAN; Betula, Reigate, May, 1901.

NOTE ON VANESSA POLYCHLOROS, &c.—Hybernated specimens of this butterfly seem unusually plentiful this year in our neighbourhood. I have observed it on the following dates: April 1st, 7th, 8th, 19th, and May 1st. On April 19th I worked for it, and came upon a regular swarm at the side of a copse near Holmbury St. Mary, and took as many as I wanted for ova. *V. urticae* is plentiful, but not so plentiful as *V. polychloros*; and I have seen two specimens of *V. io*. *Lycæna argiolus* is out in some numbers on Holmwood Common.—F. A. OLDAKER; Parsonage House, Dorking, May 1st, 1901.

NOTIDOBIA CILIARIS.—On May 5th this caddis-fly was out in good numbers on the herbage along the bank of the canal near Byfleet. Having but recently emerged, the wings had not lost their full black colour, and I noticed that several females were carrying a yellow mass of eggs attached to the apex of the abdomen (*vide* E. M. M. vol. i. p. 216, 1865).—W. J. LUCAS; 28, Knight's Park, Kingston-on-Thames.

EARLY DATE FOR ANAX IMPERATOR.—Rev. F. A. Walker, D.D., reports the capture of a female of this magnificent dragonfly on May 11th at West Heath, Hampstead. The earliest date previously noticed was of a speci-

men taken by Mr. C. A. Briggs on May 15th, on Oekham Common, in the particularly early season of 1893.—W. J. LUCAS; Kingston.

EASTER (1901) IN THE NEW FOREST.—The forest half under water, and scarcely any willows in bloom, was the state of things we found on arrival at Brockenhurst on April 4th. Up to the 7th the weather was most depressing, and collecting either impossible or very unpleasant. A few fine mornings, however, improved things wonderfully, and the results of a week's collecting were fairly satisfactory. When sufficiently sunny and tempting, hibernating butterflies abounded—*Eugonia polychloros* and *Gonepteryx rhamni* being especially common, whilst a fair number of *Aglais urticae* were seen. *Brephos parthenias* was fairly common among the birches, but was, as usual, not easy to catch, though a few specimens were obtained. They suddenly disappeared on the 11th, though perhaps the most favourable day for their flight; whether or not the heavy rain and violent winds had finished them off I do not know, but not one was to be seen. One rather worn example of *Asphalia flavicornis* was found hanging like a leaf from a low birch-twig. *Xylocampa lithorhiza* scarcely seemed so common as in the two previous years, though three examples were found on one birch-trunk. I have noticed in three Easters at the forest that this insect is nearly always on birch- and fir-trunks, generally very low down, and not in places where the trees grow thickly together. A single very fresh-looking *Xylina rhizolitha* was taken from a fir-trunk. A nice variable lot of *Tephrosia bistortata* was obtained, principally from larch and fir, but a few from oak-trunks. Two very fine specimens of *Lobophora lobulata* were netted, showing the delicate green tinge of freshly emerged examples of this species. A few odd examples of *Anticlea badiata*, *Hybernica marginaria*, *Anisopteryx æscularia*, and *Hypena rostralis* (1), and one or two larvæ of *Bombyx trifolii* and *Noctua neglecta* (?), complete the day-work. At night treacle produced a nice variable series of *Tæniocampa munda*, but little else; *Cerastis vaccinii* (very abundant), *Scopelosoma satellitia*, *Tæniocampa stabilis*, and *T. cruda*. The willows, once found, proved productive. *Tæniocampa stabilis* and *T. cruda* swarmed. A few *T. munda* were taken, but this species prefers treacle. *T. gothica*, not very abundant. *T. miniosa*, a few quite fresh, apparently only just emerging. I was pleased to meet with *T. instabilis*, as I had not previously taken it in the forest, and made a comment in my last Easter notes on its apparent local scarcity (Entom. xxxiii. 206). Mr. E. R. Banks also contributes a note (Entom. xxxiii. 349) with reference to my query. Only four specimens were taken, but all in perfect condition. Single examples of *Pachnobia rubricosa*, *Xylina rhizolitha*, *X. socia*, and *Trachea piniperda* were also taken. No doubt we did not visit the right part for the last-named insect, which I believe was common enough in the locality we worked last year. *Cerastis vaccinii* and *Scopelosoma satellitia* were common, and a few *Xylocampa lithorhiza* turned up. *Anticlea badiata*, *Cidaria psittacata* (one), *Larentia multistrigaria*, *Anisopteryx æscularia*, and *Eupithecia abbreviata* were also taken at the willows. On the wing, or at rest on twigs, *Anticlea badiata*, *Hybernica marginaria*, and one *H. rupicaprararia* were taken.—F. M. B. CARR; 46, Handen Road, Lee, S.E.

ISCHNURA PUMILIO IN CORNWALL.—In the 'Entomologist' for February, p. 53, I see that both Mr. Dale and Mr. Lucas have made mention of the dragonfly (*Ischnura pumilio*) as having been taken near Land's End in

1864. It may interest them to know that I took, on June 10th, 1900, a male *I. pumilio*, and on June 17th a male and female, at a pond midway between Penzance and Land's End; but, I am sorry to say, that when on the setting-board drying, their abdomens were attacked by wasps, and partially eaten. There is not the least doubt about the identity of the specimens, as I do not know another species amongst the small blue fry that has the nervures of the wings of a red-brown when fresh caught like *I. pumilio*. They were easily named from the illustration in Mr. Lucas's splendid work on the Odonata. The wings and thorax were not damaged, so I have kept the remains; but I have not them here at Mansfield. I left them behind me at Porth Enys Museum, Paul, near Penzance, where I spend most of the season.—WILLIAM DAWS; 39, New Wood Street, Mansfield Notts.

[From a further communication received from Mr. Daws, there seems no doubt that his captures are *I. pumilio*; he has had some years' experience with the Odonata, and would not be likely to confuse *I. pumilio* with *I. elegans* when making a careful examination of the fresh specimens, as he was able to do in this case. Mr. Daws hopes to take the species again during the present season.—W. J. L.]

MARGARODES UNIONALIS IN HAMPSHIRE.—A specimen of *M. unionalis* was taken on Sept. 21st, 1900, at a lamp in the Sea Road, Boscombe.—THEODORE H. ROBINSON; Serampore, Boscombe, Hants.

[This species has been taken at Forest Hill, Gravesend, Deal, Brighton, Isle of Wight, Gosport, Torquay, and Tresco. Its occurrence in Britain was first noted in 1859, and the last capture that we are aware of previous to that now recorded by Mr. Robinson was made at Gosport in 1884 (*vide* Entom. xxiii. 277.—ED.)]

PLUSIA MONETA IN NORTH LONDON.—I have the pleasure to record the finding yesterday of larvæ of *Plusia moneta* feeding on *Aconitum* in a garden here. I have not heard of its capture in this district previously.—V. E. SHAW; 8, Moss Hall Grove, North Finchley, N., May 24th, 1901.

OPORABIA AUTUMNARIA IN DELAMERE FOREST.—Two specimens I took in the forest some time ago have been identified by Mr. L. B. Prout. They have hitherto occupied a place in my collection as doubtful varietal forms of *O. dilutata*. The locality for the species is not new, as it was known to Mr. Gregson many years ago.—J. ARKLE; Chester.

EARLY APPEARANCE OF HYDRILLA PALUSTRIS AT CARLISLE.—While collecting near Carlisle on May 20th last I netted a fine male *Hydrilla palustris* flying along a hedge about 9.10 p.m.—J. E. THWAYTES; 8, Clement Place, Carlisle.

LYCENA ARGIOLUS AND OTHER INSECTS IN MAY.—I noticed this species flying about Snargate Street, Dover, in the morning of May 2nd. In the afternoon I returned to town, and in the afternoon of the following day (May 3rd) I noticed it again in a Kingsbury lane leading down to Hendon. I may also mention that while at Dover my daughter noticed *Gonepteryx rhamni*, and I also observed the following species: *Pieris rapæ*, *Vanessa io*, *V. urticae*, the last named species in very good condition for presumably hibernated specimens. I was informed by Mr. F. W. L. Sladen, the well-known hymenopterist of South-east Kent, that *Vanessa polychloros* was very common on the downs this season, though not usually abundant in that

locality, but as hybernated somewhat the worse for wear. Between Arch-cliff Fort and Shakespeare's Cliff I captured *Bombus terrestris*, *Anthophora pilipes*, *Andrena albicrus*, *A. pilipes*; and of Diptera, also on the West Cliff, *Bibio marci* and *B. hortulanus* were observed.—(Rev.) F. A. WALKER; Dun Mallard, Cricklewood, N.W.

ERRATA.—Page 161, lines 21 and 23, for “birch” read “beech.”

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—*April 3rd, 1901.*—Mr. Charles G. Barrett, Vice-President, in the chair.—Mr. Albert Piffard, of Felden, Boxmoor, Herts, and Mr. Percy Lathy, of Lyndon Villa, Sydney Road, Enfield, were elected Fellows of the Society.—Mr. Goss read a letter from the Right Hon. Charles Ritchie, Secretary of State for the Home Department, conveying the King's thanks for the loyal and dutiful address of the Fellows of the Entomological Society of London, expressing their sympathy with His Majesty and the Royal Family on the occasion of the lamented death of Her late Majesty Queen Victoria.—The Rev. A. E. Eaton sent for exhibition, on behalf of Mr. F. M. Halford, a female sub-imago of a species of Ephemeridæ, of the genus *Ephemera*, received from Central Africa, without more precise indication of locality, the first time this genus has been noticed from Africa. Mr. McLachlan remarked that *Ephemera* usually occurred in cold alpine or temperate regions, and that the Central African example probably inhabited the mountains at a considerable altitude.—Dr. Chapman exhibited cases of *Luffia ferchaultella* from Cannes, and a spider, which are found on the same rocks, the interest of the specimens being in the fact that the spider, when at rest, has almost precisely the same form and coloration as the cases of the moth.—Mr. W. L. Distant communicated a paper entitled “Enumeration of the Heteroptera (Rhynchota) collected by Leonardo Fea in Burma and its vicinity.”

May 1st.—The Rev. Canon W. W. Fowler, M.A., in the chair.—Mr. C. G. Barrett exhibited, for Mr. H. W. Vivian, a specimen of *Xylophasia lateritia*, Hufn., a species not hitherto recorded in the British Islands, taken in South Wales by Mr. W. E. R. Allen; also *Deiopeia pulchella*, from the same district; *Diantheicia luteago* var. *barrettii*, from one of the islands off the Glamorganshire coast; and varieties of *Eupithecia virgaureata*, much blackened, *E. lariciata*, *E. satyrata*, and *E. exiguata*, taken in the county of Glamorgan by Mr. Vivian.—Mr. M. Jacoby exhibited specimens of *Helicopris gigas*, L., from Mashonaland, and *Silpha biguttata*, Fairm., from Patagonia.—Sir George Hampson exhibited two females of an apterous Lasiocampid from the Transvaal, with cocoon and ova bred by Colonel J. M. Fawcett, 5th Lancers. The larva is very much like that of the British *Lasiocampa rubi*. The female does not emerge from the cocoon, its antennæ being aborted and all the joints coalesced with a flabellate organ with slight striæ indicating the joints; the fore tibiæ short, with traces of tibial claws. The male is unknown, and as Colonel Fawcett was on active service at the time of emergence, he was unable to expose the

female for the purpose of attracting the male.—Mr. H. St. J. Donisthorpe exhibited specimens of *Ripersia tomlini*, Newst., a coccid new to Britain, taken among *Lasius niger* at Portland in April, 1900. The species, which is myrmicophilous, was first discovered in Guernsey.—Mr. C. P. Pickett exhibited aberrations and varieties of *Lycæna bellargus*, *L. corydon*, and *L. astrarche*, taken by him in August, 1900, at Folkestone and Dover.—Mr. H. Goss exhibited a gynandromorphous specimen of *Lycæna bellargus*, which he had taken at Reigate in June, 1900. It had the characters of a male in the right wings, and the characters of a female in the left wings, which were, however, not entirely free from the blue scales of the male. No dissection had been made of the genitalia, so it was impossible to say whether the specimen was strictly hermaphrodite.—Dr. Chapman exhibited a cocoon of *Antheræa mylitta*, and a flint from Redhill—two objects with practically nothing in common. Whilst dissenting *in toto* from those who see nothing in many cases of mimicry but accidental resemblance, he presented them with this as a case undoubtedly in accordance with their views, the cocoon and the flint being remarkably alike.—Professor Poulton exhibited an apparatus invented by him to determine the strength of the formic acid shot out by the ant in defence of its nest. Mr. Donisthorpe, he said, had noticed that a shower of formic acid had sometimes a great effect, and he thought it would be interesting to decide the quantity of anhydrous acid. In the case of *Dicranula vinula*, the fluid, which contains forty-five per cent. of acid, was painful in the eye, but did not damage the skin or body. He considered that the acid was only virulent during the time that the larvæ and pupæ were in the nest, and that it was used purely for defensive purposes.—Mr. F. Enock exhibited specimens illustrative of the metamorphoses of dragonflies. Mr. F. Enock read a paper entitled “The Metamorphoses of *Æschna cyanea*, illustrated by the electric lantern with photographs taken from life.” Sir George Hampson, Bart., communicated a paper on “The classification of a new family of the Lepidoptera”; Mr. Martin Jacoby, a paper entitled “A further contribution to the knowledge of African Phytophagous Coleoptera”; Messrs. Gilbert and J. Arrow, a paper entitled “The Carabid genus *Pheropsophus*; notes and descriptions of new species.”—H. ROWLAND-BROWN, *Hon. Sec.*

SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—February 28th, 1901.—Mr. H. S. Fremlin, F.E.S., President, in the chair.—Mr. F. N. Clark exhibited a specimen of *Pieris rapæ*, which emerged indoors on February 22nd.—Mr. McArthur, an example of *Arctia caia*, with smoky hind wings. It emerged in December, 1890, and was one of a third brood.—Mr. Harrison, a long and varied series of *Luperina testacea* from Wallasey, among them being two examples of the var. *nigrescens*.—Mr. Edwards, pieces of chestnut branches, showing the ravages of the larvæ of *Zeuzera pyrina*, a species doing considerable damage at the present time in the London parks and squares.—Mr. Main, a Mantis from West Africa, having large ocellated markings on the fore wings (*Harpax*?).—Mr. Montgomery, photograph of a large larva breeding-house and a number of cages for rearing Lepidoptera, to illustrate his paper on “The Breeding of Lepidoptera,” where he detailed his methods of obtaining ova, of keeping young larvæ,

of treating hybernating larvæ, and of keeping pupæ. A considerable discussion took place, several members giving their own experience and the methods they had found successful in rearing Lepidoptera.

March 14th.—The President in the chair.—Mr. Colthrup, a long series of females of *Polyommatus icarus* and *P. bellargus*, most of which showed a considerable amount of the male coloration. Several of the former were prettily splashed with white. They were all from Eastbourne.—Mr. Routledge, a moth which he supposed to be a male of *Hydrilla palustris*. It was taken near Carlisle by Mr. Thwaites with a net whilst sugaring on June 10th, 1899. Several members doubted its identity, but could not tell what species it was.—Mr. Harrison, a long series of *Aplecta nebulosa* from Delamere Forest, including var. *robsoni*, and a specimen of *Xylophasia monoglypha* var. *æthiops* taken at the same time and place.—Mr. Adkin, a long bred series of *Caradrina ambigua*, which emerged in December, and read notes on the habits and food of the larvæ.—Mr. McArthur, preserved larvæ of *Abraxas grossulariata*, *A. ulmata*, and *Pachnobia alpina*, with a specimen of *A. ulmata* taken near Brighton some fifty years ago. He stated that the latter species was not again taken in the district till some sixteen years ago, when it was found, locally, in some numbers.—Mr. Kirkaldy, specimens of the lantern flies, *Pyrops candelarius* and *P. maculatus*, and contributed notes as to their protective resemblance to their surroundings.—Mr. Burr called attention to the evasive habits of some British grasshoppers; large active males would leap and fly, heavy females would burrow, while the smaller individuals would run round the stems.—Mr. Manger, a large number of exotic dragonflies.—Mr. Turner, a microscopic slide showing fossil remains in limestone from Montgomeryshire.

March 28th.—The President in the chair.—Mr. Sich exhibited specimens of *Goniodoma limoniella* (*auroguttella*), and stated that the larva quits the case when about to pupate; the following species of the genus *Coleophora*, *C. deauratella*, *C. frischella*, *C. alcyonipennella*, *C. ochrea*, *C. vibicella*, and *C. salicornia*, of which the last named also quits the case to pupate, together with specimens of *Gelechia tenebrella*, which bears a close superficial resemblance to *C. alcyonipennella*.—Messrs. Harrison and Main, series of early spring Geometers taken this year in Delamere and Epping Forests. Among them was a specimen of *Nyssia hispidaria*, taken in the former place.—Mr. West (of Streatham), pieces of amber containing Homopterous and Dipterous insects.—Mr. R. Adkin, specimens of *Acherontia atropos* bred from larvæ taken in Huntingdonshire, and read notes on the forcing of the species, especially calling attention to the internal appearance of the pupæ which failed to emerge. A discussion ensued, and various other methods of forcing were described.—Mr. Montgomery, a larva of *Charaxes jasius* sent to him from Cannes, with a *Gordius* worm which had extruded from it.—Mr. Bishop read a paper on "The Natural History of the Guildford District."

April 11th.—The President in the chair.—Mr. Carpenter exhibited a large number of specimens of *Pieris napi*, bred from one batch of ova. Half the specimens had emerged in June and early July, while the remainder emerged the following April and May. The former were very uniform, while the latter were very variable in the female

specimens. He also showed a long series of bred *Melitæa aurinia* from Penarth and Carlisle.—Mr. McArthur, bright and well-marked specimens of *Plutella annulatella* from the Orkneys.—Mr. Fremlin, a number of specimens of Lepidoptera and other insects taken during a short trip to Canada in 1900, and read notes.—Mr. Lucas, the species of Odonata taken by Mr. Fremlin at the same time, including species of the genera *Sympetrum*, *Libellula*, *Gomphus*, *Æschna*, and *Agrion*.—HY. J. TURNER, *Hon. Rep. Sec.*

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY.—*April 15th, 1901.*—Mr. R. Wilding in the chair.—Minutes of the preceding meeting were read and confirmed.—Mr. Wilding again thanked the St. Helen's members who had done so much to make the previous meeting a success. He afterwards referred to the death of Mr. Robert Brown, one of the oldest members, who, although his special study was botany, had always taken an interest in the doings of the Society.—The Rev. R. Freeman proposed that the Society adjourn until October. Dr. J. Cotton seconded, but suggested that a field meeting should be held in June at Delamere. The Secretary was deputed to make preliminary arrangements.—Mr. C. E. Stott, of Bolton, communicated a paper by Mr. F. H. Day, of Carlisle, entitled "Notes on the Coleoptera of the Cumberland Mountains," in which he gave accounts of the rarer and more interesting of the beetles which find a home on the slopes of Scawfell and its neighbours. Mr. Wilding, who read the paper, said that the species were identical with those of the Welsh mountains,—that he had taken many of the insects named on the slopes of Snowdon and the hills around Llangollen; thus affording another proof that when the localities are similar the insect faunas are alike also, though perhaps two hundred miles apart. A discussion on these points was carried on by the Chairman, Messrs. Freeman, Burgess-Sopp, Pierce, Cotton, and Birch, after which the following exhibits were examined:—Mr. Day's case of specimens illustrating his paper, which included that burnished gem *Carabus nitens*, an insect made resplendent by its coppery thorax and metallic green elytra; *C. glabratus*, *C. arvensis*, *Pterostichus æthiops*, *Aphodius lapponum*, and many other rarities, by Mr. C. E. Stott. *Bembidium nigricorne* and *Philonthus quisquiliarius*, the latter new to the Liverpool fauna, by Mr. Wilding. *Spongiphora lherminieri*, a remarkable Orthopteron from Espirito Santo, by Mr. Burgess-Sopp. *Phigalia pедaria* and *Acalla literana*, by Mr. A. Tippins.—FREDERICK BIRCH, *Hon. Sec.*

BIRMINGHAM ENTOMOLOGICAL SOCIETY.—*March 18th, 1901.*—Mr. G. T. Bethune-Baker, President, in the chair.—Mr. J. T. Fountain showed a series of *Callimorpha hera* taken in Jersey last year, also living larvæ of the same. He had found a batch of the eggs on a leaf of ivy, and had succeeded in getting some of the larvæ thus far through the winter, and they had now become active. He referred to the habits of various hibernators in the spring, and said that he had often seen the larvæ of *Arctia caia* in the early spring on posts, &c., in the sunshine, having apparently come up to sun themselves, and that they went down again as soon as the sun went in; he had also seen the pupæ of *Bombyx rubi* come up to the top end of their cocoons in sunny weather, also apparently to feel the warmth of the sun.—Mr. R. C. Bradley exhibited

Mutilla europæa (males), and *rufipes* (females), taken at Bournemouth last summer.—Mr. C. J. Wainwright, various Hymenoptera, including a series of the rare Chrysid, *Cleptes pallipes*, from West Runton, Norfolk, and *Osmia aurulenta* and other bees from Selsley, Glos.

April 15th.—The President in the chair.—Mr. R. C. Bradley showed a few Lepidoptera taken last year, including *Colias edusa*, *Aspilates citraria*, &c., from Bournemouth, and *Catocala nupta* from Swanage.—Mr. G. W. Wynn, a series of *Callimorpha hera* taken by Mr. E. A. Rogers near Dawlish, ranging from yellow through intermediates to red forms. Also a series of *Spilosoma lubricipeda* var. *radiata*, bred from ova received from Mr. W. Tunstall, of Huddersfield.—Mr. J. T. Fountain, a number of insects taken by himself in Jersey last summer, including *Colias edusa* var. *helice*, very fine *Satyrus semele*, and the Diptera *Asilus crabroniformis* and *Volucella zonaria*, the latter being a very fine Syrphid not yet known as British.—Mr. A. D. Imms, various Lepidoptera, including *Polia flavicincta*, from Northampton, where he had found it very abundant at sugar, and *Sphinx convulvuli*, from Moseley.—Mr. G. T. Bethune-Baker, *Vanessa urticæ*, with all its geographical forms and races, including vars. *ichnusa*, *polaris*, &c.; also specimens of *Colias edusa*, for comparison, with a purple gloss on their wings.—Mr. Colbran J. Wainwright, Diptera; the two British species of *Sepedon sphegeus* from Sutton Park, and *spinipes* from Chalford, Glos., and three species of *Limnia marginata* from St. Ives, Cornwall, and West Hide, Herefordshire; *rufifrons* from West Hide, and West Runton, Norfolk; and *ungrucornis* from West Runton and Sutton Park, where this latter species is abundant.—Mr. A. H. Martineau, the six species of the *helvola* group of the genus *Andrena*, in order to point out the very slight distinctions between them=*apicata*, Smith, *lapponica*, Bett., *helvola*, L., *ambigua*, Perkins, *fucata*, Smith, and *varians*, Rossi.—COLBRAN J. WAINWRIGHT, Hon. Sec.

RECENT LITERATURE.

W. B. BENHAM. "Note on *Cordyceps sinclairii*, Berkeley." (1900. Trans. New Zealand Institute, xxxii, pp. 4-8, plate I.)

THERE is a genus of fungi containing a number of species parasitic on insects.* During the ultimate nymphal instar, spores of the fungus, giving rise to thread-like hyphæ, enter the tissues of the living insect to make their way in all directions, gradually replacing the living tissues, and, of course, occasioning the insect's death. Some of the hyphæ, in order to disseminate the future spores, push their way, as a compact bundle, through the skin of the insect, growing upwards into the air. A well-known example is *C. hugelii* (= *robertsii*), the New Zealand "Vegetable Caterpillar." In the present paper, Benham notices a species (*C. sinclairii*) attacking the nymph of *Cicadetta* (or, as he calls it, "*Cicada*"), a genus of Cicadidæ strongly represented in Australia and New Zealand. The fungus "issues between the head and the pronotum. The main branch grows straight forward for some

* Benham says "confined to insects," but a little later notes that the conidial stage may occur on bark, leaves, &c.

distance, and gives off branches right and left in a very characteristic fashion."

"The two different modes of spore-formation yield different kinds of spores—(1) *Ascospores*, formed by subdivision of the protoplasm inside a single cell or 'ascus'; (2) *Conidiospores*, formed by constriction of a hypha, so as to form a row of spores arranged more or less like a string of pearls or beads." The remarkable fact is that while *C. hugelii* (the "Vegetable Caterpillar") is known only in its ascospore stage, it is only the conidial stage of *C. sinclairii* that is known. Both stages are known in some European species, the conidial stage not necessarily growing on an insect (but sometimes on leaves, bark, &c.), so that possibly the two New Zealand forms may be merely links in the life-history of one species of *Cordyceps*.

G. W. K.

Die Dermopteren und Orthopteren von Österreich-Ungarn und Deutschland. Bearbeitet von JOSEF REDTENBACHER. Wien: 1900.

WITH present-day British authors, the Dermoptera (Earwigs) are usually looked upon as the first division (*Forficularia*) of the Orthoptera; but Redtenbacher, on the other hand, looks upon them as a distinct order, naming the rest Orthoptera genuina. Leach also early in the nineteenth century gave the Earwigs ordinate rank under the name of Dermaptera, which name, however, De Geer had previously proposed for the whole of the Orthoptera. Leach's estimate of the position of this interesting group of insects has found favour with a number of British authors, who have treated them with the same distinction as Redtenbacher.

Thirteen Earwigs are enumerated, *Forficula lesnei* and *Apterygida arachidis* not being amongst them; but the latter has been recorded from two localities only in Britain, and those not out of doors.

Of the Cockroaches there are sixteen in all, including five species of the genus *Aphlebia*, which so far is unrepresented in Britain, and five of the genus *Ectobia*, the three British species being amongst them. The British casuals—*Nyctibora holosericea*, *Rhyparobia maderæ*, *Leucophæa surinamensis*, and *Blabera gigantea*—are not mentioned, while *Blatta australasiæ* is not given a recognised position.

In Britain the Mantids and Phasmids are unrepresented; but for Germany and Austria Redtenbacher is able to give four of the former, including *Mantis religiosa*, and one of the latter.

Of the Grasshoppers proper we have in Britain eleven species, in addition to about five casuals, amongst these five being the "locusts" that occasionally reach our shores. In Germany and Austria there are seventy-one. Of the Locustids there are eighty-nine as against our nine. Of Crickets there are seventeen to our four.

The book, which is in German, is a large octavo of 148 pages, in paper covers, and is printed in large clear type. One lithographic plate of details constitutes, unfortunately, the whole of the illustrations. There is but little introduction, and the descriptions and notes on each species are short. The work takes the form of a synopsis, and therefore appeals to the specialist rather than to the general reader.

W. J. LUCAS.

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[No. 458.

NAMES AND DEFINITIONS OF HYBRIDS.

BY T. A. CHAPMAN, M.D., F.E.S.

Ent. Record, vol. xiii. p. 183; Dr. Standfuss, "Experiments on Hybridization," reprinted from the 'Entomologist,' pp. 23 and 34. These two recent items remind me of a simple expedient for defining hybrids that, I imagine, must have occurred to someone and been adopted, yet Dr. Standfuss's unwieldy notation, that compels him to use a number in the text, and his reader to refer back to pp. 23 and 34 to see what the number means, implies that it has not been adopted, or probably proposed. The idea simply is to abbreviate the name of the insect as much as possible, often to an initial, and to place the two names thus abbreviated together, the male always first. Thus, if dealing with Saturnias, as on Dr. Standfuss's p. 23, his most complicated cross, No. 18, which he writes:—

$$\text{Sat. } \frac{\left(\frac{\text{pavonia } \delta}{\text{spini } \delta} \right)}{\text{pavonia } \delta} \delta$$

would be written Sat. Pa S. Pa Pa—Pa S. Pa Pa, or simply Sat. Pa S Pa Pa Pa S Pa Pa. A hybrid being always designated by its 2, 4, 8, 16, or more parents. This one is a little complicated by having to write Pa, to distinguish *pavonia* from *pyri*.

Similarly Dr. Standfuss's No. 30—

$$\text{Pyg. } \frac{\left(\frac{\text{curtula } \delta}{\text{anachoreta } \delta} \right)}{\text{anachoreta } \delta} \delta$$

would be written Pygæra C.A—A.A—A.A—A.A. If *P. anastomosis* comes into the experiment, then *Ac* must be used for *anachoreta*, and *As* for *anastomosis*.

The advantages of this notation are that it can be easily written in the text, and conveys at once to the eye the ancestry and constitution of the form before us.

NEW AND LITTLE-KNOWN BEES FROM NEBRASKA.

By T. D. A. COCKERELL.

THE following bees were kindly communicated to me by Mr. J. C. Crawford, Jun., and Prof. L. Bruner :—

Perdita affinis, Cresson.—West Point, Aug. 12th, 1900 (J. C. Crawford). Both sexes at flowers of *Solidago rigida*. New to Nebraska.

Perdita albipennis, Cresson.—Lincoln, Aug. 17th, 1900 (J. C. Crawford). Both sexes at flowers of *Helianthus annuus*.

Perdita bruneri, Ckll.—West Point, Aug. 6th, 1900 (J. C. Crawford). Two females at flowers of *Grindelia*; one is larger than usual.

Perdita perpallida, n. sp.—Lehigh, July (Cary). Both sexes at flowers of *Petalostemon*.

Length about 6 mm., very pale yellowish, colour of *P. woottonæ*, but without any black patch on pleura in either sex. Female with legs entirely pale, but male with a large black patch on inner side of anterior femora beneath. Male flagellum pale orange, not marked with black above. Stigma very pale yellow, nervures colourless. Abdomen entirely without bands. Ocelli black, but no black lines on vertex in either sex.

Perdita crawfordi, n. sp.—Lincoln, Nebr., Aug. 25th, 1900 (J. C. Crawford). Male at sunflower; female at *Grindelia*.

♂. Length about 5 mm.; head and thorax dark bluish green; head ordinary; cheeks with a short tooth on lower part; front, vertex and cheeks with short white hair; vertex minutely granular; antennæ dark brown above, very pale beneath; clypeus and lateral face-marks cream-colour; clypeus wholly pale except the usual dots; lateral marks transversely oblong, not quite reaching the level of the upper edge of the clypeus, the inner side bulging above, and thus larger than that adjacent to the eye; no supra-clypeal or dog-ear marks; thorax rather abundantly clothed with white hairs; no light markings on prothorax or pleura; wings milky-hyaline; nervures white, stigma faintly yellowish; marginal cell nearly squarely truncate, the sub-stigmatal portion about as long as the post-stigmatal; second sub-marginal cell greatly narrowed above; third discoidal cell only faintly indicated; legs black, knees, anterior tibiæ in front, and the tarsi, pale

yellowish; abdomen shining piceous, without light markings, but the hind margins of the segments hyaline.

♀. Length 5 mm.; similar to the male, but the lateral face-marks are nearly equilateral triangles; and the second, third, and fourth abdominal segments have basal straight pale yellowish bands, narrowly interrupted in the middle, and those on the third and fourth segments terminating abruptly some distance before the lateral margins.

In my tables of *Perdita*, the male runs to *P. vagans*, and the female to *P. bigeloviae*; but the face-markings are not as in those species, and other differences are apparent on comparison.

Perdita maura, n. sp.—Cedar Bluffs (L. Bruner). Both sexes at flowers of *Aster*.

♂. Length about $4\frac{1}{2}$ mm.; head and thorax dark bluish-green, metathorax blue; abdomen broad, shining black without marks, the hind margins of the segments not hyaline. Head ordinary, cheeks unarmed; face-marks yellow; clypeus yellow except the sides above, and the whole of the upper median margin, the yellow therefore occupying all the lower half of the clypeus, and sending a broad tongue upwards in the median line; supra-clypeal mark divided into two adjacent patches; no dog-ear marks; lateral face-marks broadly triangular, their upper angles (of about 45°) about level with the antennal sockets; scape and flagellum dark brown above and yellow or brownish yellow beneath; face not hairy; mesothorax granular, with feeble punctures, median groove very distinct: thorax with sparse short hair; wings hyaline, nervures and stigma very dark brown, third discoidal cell ill-defined; marginal cell ordinary; legs black, knees, anterior tibiae and tarsi, and middle tibiae and tarsi, more or less yellow.

♀. Length about $5\frac{1}{2}$ mm.; similar to the male, except as follows: face wholly dark, but the mandibles are yellow with dark ferruginous tips; third discoidal cell distinct; anterior tibiae behind, and middle tibiae, black.

P. maura in my tables runs in the male to *P. asteris*, var., but it is quite distinct from that species, which has milky wings with almost colourless nervures and stigma. The female runs in the neighbourhood of *phymatæ*, but that is a much smaller and less bulky insect.

Spinoliella australior (Ckll.), Sioux Co. (L. Bruner). Both sexes at *Cleome* flowers. New to Nebraska.

East Las Vegas, New Mexico, U.S.A.:

Nov. 14th, 1900.

SIX NEW SPECIES OF CULICIDÆ FROM INDIA.

By LT.-COL. G. M. GILES, M.B., F.R.C.S., I.M.S.

(Communicated by F. V. Theobald, M.A., F.E.S.)

CULEX TRITÆNIORHYNCHUS, sp. n.

Wings unspotted. Tarsi minutely basally banded, pale ochreous. Thorax unadorned, fuscous. Abdominal segments fuscous, with rather narrow yellowish white basal bands. Proboscis with three ochreous bands.

A minute species of generally dusky tinting and proportionately long legs. Head fuscous; eyes with a barely perceptible whitish margin; nape fuscous, with a few whitish hairs. Antennæ fuscous, minutely banded white in the male. Proboscis fuscous, with three separate ochreous bands, one forming the tip; the second sharply defined, and much broader beyond the middle; the third less sharply defined, especially in the female, midway between the large band and the base. Palpi (male) considerably longer than the proboscis, exceeding it by more than the length of the markedly subulate terminal joint, fuscous, with minute white basal bands to the last three joints; female exceptionally minute, nearly black, with an indistinct greyish tip. Thorax fuscous, with golden brown tomentum, unadorned. Wings hyaline, with nearly black scales. Axillary vein joining costa a little in front of base of anterior fork-cell, and slightly behind tip of anterior branch of five longitudinal; supernumerary and middle transverse veins in one line, and fully their united length outside the posterior transverse. Fork-cells both narrow and of nearly equal width, but the anterior the longer; their stems short, the posterior being a little the longer, so that the base of the corresponding cell is slightly outside that of the anterior fork-cell. Halteres pale yellow. Legs fuscous; the tarsi with minute ochreous basal bands to all the joints; first post-tarsal joint longer than the corresponding tibia in both sexes. Abdomen fuscous, with rather narrow yellowish white basal bands to the segments, broader in the middle than laterally, especially on the anterior segments. Length of wing of male 2.4 mm., of female 3 mm.

Hab. Madras.

CULEX PSEUDO-TÆNIATUS, sp. n.*

Wings unspotted. Tarsi black, with white rings formed on the bases and apices of contiguous joints. Thorax black, elaborately adorned with fine white lines (almost as in *C. tæniatus*,† Meig.). Abdominal segments black, with narrow basal bands; venter pale fawn. The general coloration is an intense violet-black.

This species bears a strong resemblance to *C. notoscriptus*, Skuse, and to *C. tæniatus*, but may be easily distinguished by the position of the tarsal banding, and its wanting the white band on the proboscis of the former species.

* This comes in my genus *Stegomyia* (F. V. T.).

† This is synonymous with *Culex fasciatus*, Fabr. (F. V. T.).

♀. Head black, with a narrow median line on the nape, and the borders of the eyes snowy white. Antennæ dark brown, slightly shorter than the proboscis, which is black throughout. Palpi about one-fifth the length of the proboscis, black with white tips, and some white spotting at the articulations. Thorax black, elaborately adorned with very narrow white lines, consisting of a median, bifurcating behind, two short straight anterior lateral lines, and outside these a pair of long sigmoid-curved lines, in the external hollow of which are yet another pair of slightly curved lines, occupying the two middle fourths of the area. The posterior border of the metanotum is armed with strong bristles. The wings much resemble those of *C. albopictus*,* and are fully the length of the abdomen, hyaline, the veins clothed with linear black scales; axillary vein joining the costa a little before the tip of the posterior branch of fifth longitudinal, and just short of the base of the anterior fork-cell; supernumerary and middle cross-veins nearly equal, joining at an oblique angle; each rather longer than the posterior transverse, and placed twice the length of the latter outside it, and nearly opposite the tip of the sixth longitudinal; posterior transverse placed less than one-third along the anterior branch of fifth longitudinal; anterior fork-cell longer and slightly narrower than the posterior, their bases nearly opposite. Legs black, with delicate white lines on the sides of the femora and tibiæ, but no distinct knee spots; the tarsal joints have minute white bands both at base and apex, combining to form a still narrow ring on the articulation, that on base of first tarsal joint often involving the tibia; in the fore legs the upper two, in the middle the upper three, and in the hind all articulations are so ringed. Abdomen black, with very narrow basal white bands of perfectly uniform width, so that it is easy to mistake their position, and to take them as on the hinder border of segment. They are best marked in the third, fourth, fifth, sixth segments; the first abdominal segment has the dorsum covered with a peculiar beak-like backward-projecting plate of the scutellum, armed with a radiating tuft of strong bristles. Length of wing, 3.1 mm. male to 5 mm. female.

Hab. The Lower Himalayas, 6000–8000 feet (Bakloh'n Punjab, and Naini Tal). Not common, but occasionally enters houses and bites.

I have met with the larvæ in very shallow depressions in the cemented gutter round a house, in the bottom of which was only a little sand just tinted with green algæ, in perfectly clean rain-water. They are about 8 mm. long, and very dark tinted, the head being so black that the eyes cannot be distinguished. The antennæ are very short, and, with the exception of some terminal specialized short bristles, are almost naked, and not, as usual, indistinctly two-jointed, with tufts at the constriction. The spiracle is extremely short, not half as long as the anal tubercles, and no longer than an average abdominal segment. With the exception of the large thoracic tufts, the bristles are not distinguishably compound. In the water they hold themselves

* This is synonymous with Walker's *C. scutellaris*; both come in my new genus *Stegomyia* (F. V. T.).

nearly vertical to the surface. The pupæ are also intensely black.

CULEX GUBERNATORIUS, sp. n.*

Wings unspotted. Tarsi each with two bands, one at the base of the first, the second over articulation between first and second joints. Thorax sooty, with a round anterior median and four lateral snowy spots at the corners of the notum. Abdominal segments black, with large snowy lateral spots, and a minute terminal median spot on the last; venter sooty.

♀. Head sooty black, the nape with a minute median line, a delicate border to the eyes, and a pair of small lateral spots behind them snowy white. Antennæ, proboscis, and palpi entirely black, the former with the second no longer than the succeeding joints. Thorax sooty, with snowy spots arranged as below; in front there is a large median spot, which is prolonged at the sides into a pair of lateral bars, in front of which are scarcely perceptible separate humeral spots; there is a similar pair of short lateral transverse bars at the posterior corners of the notum, besides which the pleuræ and coxæ are plentifully speckled. The posterior border of the metanotum is armed with three tufts of bristles. Wings hyaline, the veins with black scales; auxiliary vein joining the costa a little external to the middle transverse vein; second longitudinal vein springing from the first only a trifle internal to the posterior transverse; supernumerary and middle transverse veins in one line; together not much longer than the posterior transverse, and placed distinctly more than their united length outside it; anterior fork-cell somewhat longer and narrower than the posterior, but having a somewhat longer stem, which is about two-thirds as long as the cell. Halteres with white stems and black knobs, their roots protected by distinct membranous tegulæ. Legs black, with the exception of a fairly broad white band at the base of the posterior femora, and smaller patches on the under surface of the other femora; there are large white knee spots, and two broad bands, one placed on the base of the first tarsal joint and apex of the tibia, and the second on the apex of first and base of the second tarsal; in the fore legs there is a faint ring on the next articulation. Abdomen sooty black, each segment having a pair of broad lateral basal snowy spots. There is also a minute median spot on the dorsum of the last visible segment. Venter uniformly sooty black, Length of wing 3 mm.

Hab. Taken in Government House, Allahabad.

CULEX PULCHRIVENTER, sp. n.

Wings unspotted. Tarsi unbanded, black. Thorax golden scaled, with a fine median and broader lateral black lines. Abdominal segments black, with snowy basal bands, and the venter elaborately adorned with golden, snow-white, and black markings.

Head black, with two bands of golden tomentum separated by a delicate median black line on the nape, and a delicate line of golden scales round the eyes; on the sides behind the eyes are two minute patches of white scales. Antennæ almost two-thirds the length of the

* This is a *Stegomyia* (F. V. T.).

proboscis in the male, black with black verticils; in the female the internodes are covered with whitish down; on the upper surface of the basal joint is a patch of whitish scales; second joint short. Proboscis sooty black throughout. Palpi of male but four-fifths the length of the proboscis, tapered, their terminal joints much the smallest in all dimensions; black, saving a few scattered yellowish hairs on the second joint, and a very minute yellow ring at the base of the second; in the female they are very minute, and have also a few scattered yellow hairs on the apex and base of the penultimate joint. Thorax covered with golden tomentum, through which the bare black ground shows to form black lines. On the anterior two-thirds is a large triangular golden area, divided into lateral halves by a delicate median black line; behind and external to this is a fairly broad V-shaped black mark, the limbs of which taper off in front, and at the back of the thorax laterally is yet another pair of somewhat reniform bare black marks; the golden scales are narrow and hair-like throughout, and behind develop into bristles, which project backward from the border of the metanotum in three strong tufts. The pleuræ and coxæ show a few patches of silvery scales, and there is a strong tuft of yellow hairs at the root of the wings. Wings dusky, the veins densely clothed with linear sooty-black scales. Axillary vein joining the costa midway between the supernumerary cross-vein and the base of the anterior fork-cell; supernumerary and middle cross-veins joining at a very open angle, placed a little outside the tip of the sixth longitudinal, and almost twice the length of the distinctly longer hinder cross-vein external to it; anterior fork-cell longer and somewhat narrower than the posterior; their stems about equal, the stem of the anterior being just half the length of its cell. Halteres with white stems and black knobs. Legs sooty black throughout, save for the golden lower surfaces of the femora; a distinct knee spot and a few stray bristles of the same colour on the other joints. In the male the anterior and middle legs have strong symmetrical tarsal claws, each with two accessory spines; those of the hind legs are small, symmetrical, and simple. Abdominal segments black, with narrow snowy basal bands, consisting of a pair of crescentic spots narrowly connected across the middle line, the hinder and lateral borders of the segments showing some golden hairs. Ventrally the abdomen is elaborately adorned, each of the five middle segments showing behind a large lunate golden area, bounded in front by a narrow sooty line which touches the segment in front of it in the middle line, and so separates a pair of triangular snowy patches at the sides of their bases; the anterior and hinder segments are almost purely white. Length of proboscis 3 mm.; of male palpi 2.6 mm.; of antennæ 2 mm.; of wing (female) 5 mm.

Hab. Naini Tal. Is essentially a sylvan species, though I have taken a specimen in the verandah. The larvæ are found in pools in the course of the (perfectly clean) fresh water surface drainage system, through which in heavy rain a perfect torrent of water flows. They are darkly tinted, about 8 mm. long when mature, and have a short spiracle, no longer than the last two abdominal segments, and but little longer than the anal papillæ.

The head is yellow at the sides. The pupæ are large and nearly black. I have not been able to induce imagines, newly escaped, to bite.

TENIORHYNCHUS AGER, sp. n.

Wings unspotted. Tarsal joints deep brown, with ochreous bands at base and apex, so that two joints combine to form rings at the articulations. Thorax unadorned, black, covered with mingled black and golden scales. Abdominal segments black, with distal ochreous bands. Proboscis black, with two ochreous bands at the tip and in the middle.

♀. Head black, with scattered golden scales. Antennæ dark brown, with a minute yellowish ring round the insertion of the second joint, which latter is no longer than the succeeding joints. Proboscis deep brown, with a broad sharply defined ochreous band in the middle of its length, and a second narrower one at its tip. Palpi about one-fifth the length of the proboscis, black, with a minute yellowish tip. Thorax black, covered with a shaggy tomentum of mingled black and golden scales; there are three groups of bristles on the posterior border of the scutellum, but they are only of moderate lengths. Wings hyaline, the veins clothed with alternatively black and yellow scales. Axillary vein joining the costa a little internal to tip of anterior branch of fifth longitudinal, while latter is opposite the base of the anterior fork-cell. Supernumerary and middle transverse veins joining at an open angle, and placed rather more than the length of either external to the posterior transverse, all three being of about equal lengths; the two fork-cells are of about equal width, but the anterior is much the longer, its stem being slightly shorter than that of the posterior, and less than a third the length of the cell. Legs dark coloured, clothed with a mixture of black and golden scales, the former preponderating except on the under surface of the femora; tarsi nearly black, with narrow ochreous bands at base and apex of the joints, which, combining, form five more or less distinct rings, placed on the articulations with the exception of the uppermost ring, into the formation of which the tibiæ do not enter. There are also more or less distinct ochreous knee spots. Abdomen nearly black, the segments having distinct ochreous bands on their hinder borders, broader laterally than in the middle, so that the dark portions form a series of lunate spots, the yellow bands almost combining laterally; there are seven distinct bands, the last visible segment being entirely yellow. Length of wing 4 mm.

Hab. Travancore, Madras Presidency.

CORETHRA ASIATICA, sp. n.

A single female was taken on the wall of my dining-room at Shahjahanpur, N. W. P., under a lighted lamp. It is a minute but proportionally stoutly-built gnat. From the configuration of the wing I should have been inclined to place it in *Mochlonyx*, but the first tarsal joint, although barely half length of tibia, is longer than the second tarsal. Hence I place it in *Corethra*.

It is uniformly pale straw-colour throughout. Very hirsute. Body

and legs armed with hairs, the veins of the wings alone being scaled, and even these are long and narrow, approximating to hairs; those of the internal fringe being exceptionally long. The proboscis is very short, darker than the rest of the body, very short, and bilobed. Palpi short and slender, but longer than the proboscis; antennæ not banded. Thorax indistinctly marked with a darker median line in front, tapering to disappearance behind. Outside this are lines composed of minute black dots formed by the roots of hairs, and external again to these, and behind, two pear-shaped brown spots. These markings all pertain to the ground colouring, and are not produced by tomentum. Wing broad internally. Auxiliary vein joining the costa far out and beyond the tip of anterior branch of fifth longitudinal. Fork-cells with their bases opposite, and their stems nearly half as long as the branches of the anterior fork, which is much longer and narrower than the posterior; supernumerary middle and posterior transverse veins of about equal length, the two first in one open-angled line; the last just internal to the other two, and distinctly external to tip of sixth longitudinal vein. Halteres white, with a round black dot on the end of the knob. Legs rather short and stout, very hirsute, the first tarsal joint barely half the length of the tibia, but longer than the second tarsal; uniformly pale straw-colour. Abdomen of the same tint as the rest of the body, saving a few irregular brownish specks along the sides.

Shahjahanpur: Jan. 8th, 1901.

A PRELIMINARY LIST OF THE LEPIDOPTERA OF WEI-HAI-WEI.

BY THOMAS BAINBRIGGE FLETCHER, R.N., F.E.S.

(Concluded from p. 174.)

Fam. LIMACODIDÆ.

Parasa consocia, Walk.—Common at light in July.

Fam. NOTODONTIDÆ.

Phalera flavescentis, Brem.—One specimen, at light on board, 22nd July, 1898.

Phalera fuscipennis, Butl.—Several, at light on board, 20th and 21st July, 1898. In repose, this species tucks in its head and imitates a bit of dead stick, just like our own familiar *P. bucephala*.

Cerura menciana, Moore.—A male and female, on mainland, 15th May, 1899. Judging by the large number of empty cocoons on the willows around Flagstaff Camp, this species must be fairly common. The limpet-shaped eggs furnish rather a good example of protective resemblance. Above, they are of a dull salmon colour, and would evidently resemble small galls or patches of fungi, when viewed on the leaf; whilst below they are green, and so show very little when viewed through the leaf.

Melalopha (= *Ichthyura* = *Pygæra*) *anachoreta*, Fb.—Several on willows around Flagstaff Camp, 25th April, 1899.

Fam. SPHINGIDÆ.

Macroglossa stellatarum, L.—Common throughout the whole of the warm season.

Chærocampa elpenor, L.—One specimen, at Chifu, 8th May, 1899.

Chærocampa japonica, Bdv.—One specimen, at light on board, in July, 1898.

Leucophlebia lineata, Westw.—One specimen, at light on board, 20th July, 1898.

Daphnis hypothous, Cram.—One only, 23rd June, 1898, attracted by the search-light when we were doing "night-firing," about ten miles off Wei-hai-wei. This species seems a straggler from the Tropics, as the British Museum specimens are from much more southern localities—Sarawak, Labuan, &c.

Phlegethontius convolvuli, L.—Common in September and October. Abundant all round the gulf of Pechili in 1898. (*Vide* 'Entom. Record,' vol. xi. p. 110.)

Smerinthus planus, Walk.—Two specimens, caught on the mainland on 16th July, 1898, and brought to me.

Fam. SATURNIIDÆ.

Actias selene, L.—One, on the mainland, 15th May, 1899.

Antheræa pernyi, G.-M.—This occurs in a half-wild state almost everywhere. The larvæ are found on the dwarf oak-bushes, being collected by the natives when full-grown for the silk, which forms one of the industries of the district, Chifu silk being very well known. When irritated, the larva tucks in its head and assumes a pseudaposematic appearance by exposing the eye-like mark on the fourth segment; this gleams like silver in the sunshine, and looks like a lurid eye. The moth appears in March and April, and again in July.

Fam. LASIOCAMPIDÆ.

Dendrolimus pini, L. (= *Metanastria segregata*, Butl.).—Abundant in July and August. The larvæ occur in thousands on fir-trees in May, and are full-fed about the middle of June. On 7th June, 1899, I went over to the mainland in hopes of getting cocoons, but, though I found the larvæ in plenty and enormous in size, I could not see any which had pupated. The larvæ occur in two distinct shades—orange and grey. When annoyed, they eject a clear watery liquid, and curl their heads down, thus prominently exposing the big blue hairy tufts composed of short easily-detachable bristles. If further annoyed, they lash about with their fore extremity, and try to bring these tufts in contact with the aggressor. This I permitted one to do to my finger, when it left a number of short blue hairs embedded in the skin. These hairs, which are also woven into the texture of the cocoon to form a regular *cheveux-de-frise*, are not easily extracted from the skin, but break off, leaving the points embedded, and, I have no doubt, would prove highly urticative to persons with a tender skin. On 4th October, 1899, I note: "The small fir-bushes are covered with ova of *D. pini*,

most of which have hatched out, the young larvæ being now about half-an-inch long.

Fam. ZEUZERIDÆ.

Trypanus (= *Cossus* = *Xylentes*) *vicarius*, Walk.—Common in June and July, 1898. As almost the only trees at Wei-hai-wei are willows, the conditions are favourable to the maintenance of the species; hence it is not surprising that the average size of the specimens is much greater than usual, equalling, indeed, that of our own *T. ligniperda*.

NOCTUÆ TRIFIDÆ.

Fam. AGROTIDÆ.

Acronycta rumicis, L.—One, on a willow near Flagstaff Camp, 25th April, 1899.

Leucania unipuncta, Haw.—Common in June. On the afternoon of 7th June, 1899, I saw this species flying in hundreds around flowers.

Mamestra abjecta, Hb.—One specimen, at Chifu, 9th May, 1899.

Mamestra adjuncta, Stdgr., ab. *mongolica*, Stdgr.—One specimen, at Chifu, 9th May, 1899.

Agrotis segetis, Gmel.—One only; Chifu, 5th May, 1898. Disturbed from short grass amongst the sand-hills; its colour agrees very well with that of the sand.

Peridroma (*Agrotis*) *ypsilon*, Rott. (= *suffusa*, Hb.).—Common in June.

Fam. HELIOTHIDÆ.

Heliothis dipsacea, L.—One specimen, at Chifu, on 5th May, 1898, flying round flowers in the afternoon.

Heliothis armigera, Hb.—One at Chifu, to light on board, 4th May, 1898.

Heliothis scutosa, Schiff.—Common in Leu-kung-tao on 12th June, 1898. Readily disturbed from amongst bushes; the only one I saw on the wing of its own accord in the day-time was feeding on a thistle flower.

Fam. ACONTIDÆ.

Erotyla (*Agrophila*) *trabealis*, Scop. (= *sulphuralis*, L.).—One specimen, at the eastern end of Leu-kung-tao, 10th June, 1899. This specimen agrees very well with one from Pekin in the National Collection.

NOCTUÆ QUADRIFIDÆ.

Fam. PLUSIIDÆ.

Plusia ni, Hb.—Fairly common in September and October.

Plusia gutta, Gn.—Common in October.

Fam. CALPIDÆ.

Calpe excavata, Butl.—One only, in Leu-kung-tao, 14th June, 1898.

Fam. HYPOPYRIDÆ.

Spiramia simplicior, Butl.—Common in May and again in August. Has a great liking for cultivated ground. It is very wary and, once

disturbed, difficult to capture. The colours, though so varied, match the bare earth very well when it is settled with wings outspread.

Fam. OPHIDERIDÆ.

Ophiodes tirhaca, Cram.—One, at light on board, 22nd October, 1898.

Eligma narcissus, Cram.—One specimen only, in Leu-tung-tao; found drying its wings on 12th November, 1898. The examples in the National Collection appear to have been captured earlier in the year, between June and August, so possibly this belongs to, at any rate a partial, second brood.

Fam. LAGOPTERIDÆ.

Lagoptera junio, Dalman.—Common at the beginning of September.

GEOMETRÆ.

Fam. IDÆIDÆ.

Craspedia kaschmirensis, Moore. Common in May.

Fam. ACIDALIIDÆ.

Timandra amataria, L.—One specimen, at light on board, 29th September, 1898.

PYRALES.

Fam. PYRALIDIDÆ.

Cledeobia bombycalis, Schiff.—Two specimens, at the eastern end of Leu-kung-tao; one on 28th May, 1898, the other on 24th May, 1899; it flies rapidly in the hot sunshine, and has a jerky flight. This seems a well-marked local race, if not a new species. The *bombycalis* in the National Collection are from Sarepta, Austria, and Buda. My specimens are much darker. The central portion of the fore-wings between the light transverse fasciæ is dark, and not light, yellowish-brown. The discoidal spot is also almost obsolete (quite obsolete in one), whereas in the type it is very prominent. The base of the hind-wings inside the yellowish fascia is in *bombycalis* quite light, but in the Wei-hai-wei specimens as dark as the outside portion. For this darker variety I propose the name *chinensis*.

Aglossa pinguinalis, L.—One specimen, at light on board, 18th July, 1898.

Nomophila noctuella, Schiff.—Common in May and again in October. The depth of ground-colour is very variable, and this is doubtless of use to the species, as it is in the habit of settling on the bare earth. It is noticeable that *Spirania simplicior* (*ante*, p. 199), which has much the same habits, also varies very greatly in depth of ground-colour, from grey to black.

Fam. HYDROCAMPIDÆ.

Nymphula fengwhanalisis, Pryer.—One specimen, at Chifu, in September, 1898.

H.M.S. 'Gladiator,' Mediterranean.

DIPTERA AND HYMENOPTERA IN NORFOLK.

BY COLBRAN J. WAINWRIGHT, F.E.S.

I SPENT three weeks last summer at West Runton, Norfolk, collecting insects, and some account of the species obtained there may be of interest. The village lies between Cromer and Sheringham, on the north coast, and is at the foot of a range of hills running parallel with the seashore, and about a mile or more away from it. These hills are richly clothed with woods, with pleasant open spaces, and everywhere while we were there was a great wealth of flowers of all kinds, so that the many flower-loving species of Diptera and Hymenoptera might be expected in numbers. The soil was dry and sandy, and very suited to the burrowing Aculeates, and, generally speaking, I should think it a favourable spot for the entomologist. I had a great deal of my three weeks spoilt by rain and wind, but succeeded in obtaining a very fair lot of insects. Mr. R. C. Bradley joined me for a few days in the middle, but was unfortunate in the weather, and obtained little that I had not already taken. He has already referred to a few of the Diptera we obtained in the E. M. M. for January.

Among the Hymenoptera, several species of *Andrena* were conspicuous: *tridentata*, Kirb., *nigriceps*, Kirb., and *coitana*, Kirb., were all very abundant on ragwort bloom; on the same flowers also occurred, in similar abundance, *Nomada solidaginis*, Panz., and *Colletes fodiens*, Kirb. So numerous were these species of bees that it was only necessary to sweep a bed of the flowers to get a net full of the insects, from which one could choose at will the specimens preferred. Amongst the *nigriceps*, one specimen of *simillima*, Sm., occurred. The other species of *Andrena* I took were *bimaculata*, Kirb., of which I obtained three specimens on bramble blossom; *cetii*, Schr., eight specimens on a few odd flowers of scabious, which was not a common flower there; and *gwynana*, Kirb., second brood (= *bicolor*, Fab.). Other bees which occurred were *Colletes succincta*, L., *Halictus rubicundus*, Chr., *cylindricus*, Fab., *albipes*, Kirb., *zonulus*, Sm., *Cilissa hæmorrhoidalis*, Fab., *C. leporina*, Panz., *Nomada obtusifrons*, Nyl., *Epeolus productus*, Thoms., common, burrowing in the sandy bank of a lane, where I found many of the Aculeates, also on ragwort, *Cælioxys elongata*, Lep., and *C. acuminata*, Nyl., both occurring on bramble blossom, the latter rather commonly, *Megachile maritima*, Kirb., three specimens only, *M. centuncularis*, L., *Anthidium manicatum*, L., and *Stelis aterrima*, Panz., the latter not uncommon on bramble blooms. A lane ran up the hill from the village into the woods, and, piercing the hill somewhat, left most attractive sandy banks, where many Aculeates were nesting. Many of the bees above mentioned occurred there,

burrowing or haunting the burrows of their hosts. *Cilissa* and *Epeolus* were specially abundant. There also many of the Fossores occurred, including *Astata boöps*, Schr., *Tachytes pectinipes*, L., *Pompilus viaticus*, L., *Ammophila sabulosa*, L.; and several species of *Crabro*—*4-maculatus*, Fab., *palmarius*, Schreb., *anxius*, Wesm., *panzeri*, V. der Lind, &c. One or two species occurred down close by the sea, on the flowery meadows at the top of the cliffs, and practically not at all higher up amongst the woods. *Andrena bimaculata* and *A. cetii* were only taken in these meadows; *Tiphia femorata*, Fab., I only obtained by sweeping there amongst the flowers; *T. minuta*, V. d. Lind, one specimen turned up amongst the *femorata* there; *Mellinus sabulosus*, F., was common on *Angelica* down by the shore. *Mimesa equestris*, F., occurred everywhere, but was in especial abundance on one little clump of the *Angelica* close by the shore; and a single specimen of *Nysson dimidiatus*, Jur., was obtained by sweeping on the cliffs. The following complete the list of Aculeates taken there:—*Myrmosa melanocephala*, F., *Pompilus niger*, F., *Trypoxylon figulus*, L., *T. clavicerum*, Lep., *Diodontus minutus*, F., and *D. tristis*, V. d. Lind, *Pemphredon lugubris*, F., *Crabro chrysostama*, Lep., *C. cribrarius*, F., *Entomognathus brevis*, V. d. Lind, *Oxybelus uniglumis*, L., *Odynerus callosus*, Thoms., and *O. pictus*, Curt., and a few species of *Sphecodes* and *Halictus* still undetermined.

In the garden of the cottage where we stayed, the little chrysid *Cleptes pallipes* occurred upon the leaves of raspberry-canecan. I obtained about a dozen specimens, only one, however, being a male.

The Diptera were not so numerous as the Hymenoptera, but yet I obtained some nice things amongst them, many of the best being obtained by sweeping, an excellent method for obtaining specimens, but one which gives very little opportunity of observing their habits. Mr. R. C. Bradley has already referred to some of the Trypetidæ we obtained. *T. cornuta*, F., was a specially striking capture. It is the largest and handsomest of the genus, and in life, before the lovely greens of its abdomen have all faded, it is a strikingly beautiful insect. It occurred in thousands on *Centaurea scabiosa*, but, alas, although I took many specimens and tried various methods of killing, I failed to preserve its colours. *T. tussilaginis*, F., and *Tephritis bardanæ*, Schrk., were equally abundant on burdock; indeed, the chief requirement in collecting species of this group seems to be to find the food-plant, when the flies will probably be found in attendance. Other species of this group obtained were *Spilographa alternata*, Fall.—one specimen on the raspberry leaves in the garden; *Urophora solstitialis*, L., common on *Centaurea nigra*; *Sphenella marginata*, Fall., which seems always common on ragwort; *Ensina sonchi*, L.; *Tephritis miliaria*, Schrk.; *T. tessellata*, Loew., a species not given in Mr. Verrall's list, but of

which I obtained five specimens by sweeping on the top of the cliffs; *T. vespertina*, Loew.; *Urellia eluta*, Meig., one specimen only—this species is in italics in Mr. Verrall's list; *U. stellata*, Fuessl.; *Pteropæctria frondescentiæ*, L.; and *Rivellia syngenesiæ*, Fab. Although the only water near consisted of tiny streams and small horse or duck ponds, yet I obtained a series of *Stratiomys chamæleon* on the flower-heads of *angelica*; and in the garden of the cottage, on the raspberries, *Oxycera pulchella*, Meig., occurred, but was difficult to capture, it was so skittish. I obtained some very good Muscidæ, Tachinidæ, &c., but these I have referred to elsewhere; and also the following among others—*Oncomyia atra*, F., *Physocephala rufipes*, F., *Anthrax paniscus*, Rossi, *Dysmachus trigonus*, Mg., *Chrysotoxum festivum*, L., *Actina tibialis*, Mg., and a great number of other species, many still unidentified, so that it is impossible to attempt a complete list of my captures in this order.

NOTES AND OBSERVATIONS.

GYNANDROUS SPECIMENS OF AMPHIDASYS BETULARIA.—From a batch of ova deposited by a New Forest female of *Amphidasys betularia*, taken in June, 1900, we have bred, during May this year, twenty-one males, forty females, and seven gynandrous specimens. One of the males has its antennæ only very slightly pectinated; otherwise both the males and the females are fairly normal in appearance, but hardly as large as the parents. Of the gynandrous specimens, four have male antennæ on the right, and three on the left side. The larvæ were kept indoors for a few days when newly hatched, and then sleeved on birch till full-grown. Is it not altogether unusual for such a number of gynandrous specimens to appear in one brood? With the idea of seeing if the tendency to produce these abnormal forms was continued in the ordinary specimens of the brood, an attempt was made to pair two of the latter, but it was unsuccessful, and unfortunately they were the last to emerge.—A. HARRISON; H. MAIN; 72, Windsor Road, Forest Gate, Essex.

THE BUFF VARIETY OF AMPHIDASYS BETULARIA.—In reply to Mr. Ainslie Hill (*ante*, p. 180), I do not think this form has disappeared for the last twenty years, except that there is no record of its having been bred; but during the lifetime of the late Mr. John Thorpe, he never seemed at a loss to produce specimens of the buff variety. Where did they come from? It is curious to note all the specimens are apparently bred; and Lancashire collectors could now produce this form without all the wonderful crossing mentioned (*Entom.* xxii. 163). Mr. Thorpe was connected with the cotton industry, in which large quantities of chlorine are used for bleaching purposes. All Messrs. Lomas and Fielding had to do was to rear and breed the *betularia* pupæ in the bleaching-room, when lo! and behold! buff vars. appeared,

80 per cent. and upwards, and alive too. Mr. Hill should try the experiment, and revive the long-lost variety; he could have a full series of nice fresh specimens instead of "a specimen" in his collection.—F. N. PIERCE; The Elms, Dingle, Liverpool, June 16th, 1901.

EUCHLOË CARDAMINES AT REST.—While "dusking" with the lantern in the New Forest at the end of May, a specimen of this butterfly was found at rest by Mr. H. Main on the partly uncurled tip of a frond of bracken, where it was extremely well protected by resemblance. A year or two since I recollect finding one in the same situation on Esher Common.—W. J. LUCAS; Kingston-on-Thames, June 6th, 1901.

HEMEROBIOUS CONCINNUS BRED.—Early in the spring I beat from *Pinus sylvestris*, on Esher Common, a number of yellowish larvæ mottled with a darker tint, rather under an inch long, which somewhat resembled larvæ of a ladybird, and which I took to be those of one of the Chrysopas. Several pupated, and the pupa, which seemed to be rather lively, was somewhat elliptical in shape, of much the same colour as the larva, but smaller, and was enclosed in a slight silken cocoon. Two produced imagines after a week or two at least—the exact time was not noticed. Finding that they were *Hemerobius concinnus*, a species not long since looked upon as decidedly scarce, I was sorry that I had not observed them more closely, and made figures of the larva and pupa.—W. J. LUCAS; Kingston-on-Thames.

COLIAS HYALE PUPA: A CORRECTION.—I am indebted to Dr. T. A. Chapman for calling my attention to a slip of the pen in my description of *C. hyale* pupa (*ante*, p. 171), where I stated that in the pupa the wings reach the division between the fifth and sixth abdominal segments, which should read the *fourth* and *fifth*, as is stated in my original description.—F. W. FROHAWK; June, 1901.

BERLIN CONGRESS OF ZOOLOGY.—The Fifth International Congress of Zoology will be held at Berlin, 12th–16th August next. Visits will be paid to the Museum and to the Zoological Gardens of Hamburg, and a trip will be made to Heligoland. Prof. Grassi of Rome will discourse on the Malaria-problem from the Zoological Standpoint; Prof. Poulton, of Oxford, on Mimicry and Natural Selection; and Dr. Forel, of Geneva, on Ants. For information, apply to "Praesidium des V. Internationalen Zoologen Congresses," 43, Invalidenstrasse, Berlin, N. 4.

PIERIS RAPÆ.—This species is spreading gradually in New Mexico. To-day a female specimen was taken in Las Vegas by Miss Teresa Long, one of my students.—T. D. A. COCKERELL; May 23rd, 1901.

NOTE ON THE OCCURRENCE OF PHYLLODROMIA GERMANICA, L., IN BIRMINGHAM.—Towards the latter end of May last I came across two female examples of this insect, one mature, and having an egg-capsule protruding from the genital pouch, and the other in the later nymph-stage. They were among some straw in a packing-case in the Botanical Laboratory of the Mason Science College (now the University). The case had been delivered from London, and contained German scientific apparatus. There are consequently two possible

sources whence the insects may have come to Birmingham—either from some warehouse in London, in many localities of which city the insect is well established, or by direct importation from the Continent. The fact that *P. germanica*, unlike *Stylopyga (Blatta) orientalis*, attains its full development in three or four months, and that one of the specimens taken was immature, seems to point to a probability that they were British “born and bred,” for the goods did not come direct from Germany, and moreover had been lying for nearly fourteen days in Birmingham before I observed the insect. As is well known, this species is practically cosmopolitan, but its true home seems to be the northern and more central portions of the Palearctic region. Sharp, quoting Brunner, says that it has been found in increasing numbers in Vienna, where it is displacing *orientalis*; but Miall (‘The Cockroach,’ p. 19) mentions that on the whole the latter species is dominant not only over *germanica*, but over the much larger *Blatta americana* as well. In this country the insect has established itself in a few localities only, mainly in the south-eastern counties. Burr (‘British Orthoptera,’ p. 24) gives London, Hastings, Folkestone, Aldershot, Bradford, and Bognor; while Miall (*loc. cit.*) also mentions Leeds. The egg-capsule has been described and figured by Riley (‘Insect Life,’ vol. ii. U. S. Agr. Dept.), as well as by Brunner, and therefore does not need any further description. I may add that Mr. W. J. Lucas has been kind enough to examine one of my specimens.—A. D. IMMS; “Linthurst,” Oxford Road, Moseley, near Birmingham.

CAPTURES AND FIELD REPORTS.

ISCHNURA PUMILIO IN THE NEW FOREST.—On May 27th and 28th this interesting little dragonfly was beginning to appear in the New Forest, and after lengthy search a few specimens were secured. From some points noticed while on the watch for the species, it may possibly be found that they breed in wet boggy ground rather than actually in water, as seems to be the case with *Orthetrum cærulescens*.—W. J. LUCAS; June 6th, 1901.

HESPERIA SYLVANUS.—I have recently read in ‘Butterfly and Moth Collecting’ (by G. E. Simms) that this species is very partial to “yellow gorse.” I should like to know if this has been generally noticed, as I have never seen the species on that plant, but invariably in or near woods, on brambles and bracken.—A. MARSHALL; Cranbrook, Kent, May 29th, 1901.

SMERINTHUS OCELLATUS.—A splendid specimen was captured last week, in a garden here, on a cabbage-plant.—A. MARSHALL; Cranbrook, Kent, May 29th, 1901.

ENTOMOLOGICAL NOTES FOR MAY, 1901.—From May 1st till the 15th *Lycæna argiolus* was very plentiful here, and in splendid condition. On May 13th and 14th a number of *Vanessa polychloros* larvæ emerged from the ova obtained during the latter part of April. On May 14th I took several specimens of *Thecla rubi* from an elder-flower. There were many elders about, and many flowers on this one shrub, but *T. rubi* seemed to prefer this particular blossom; I captured three specimens within two minutes.

ENTOM.—JULY, 1901.

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This insect has been abundant on Ranmore Common, and generally in the neighbourhood in greater profusion than ever before during my experience. On May 15th I took a few specimens of *Nemeobius lucina*, but could not go for them again till the 21st, when I had the good fortune to take the male and female *in coitu*. I placed the female on a primrose under a cylinder, and by the 24th over fifty ova were laid on the under sides of the leaves, some singly, others in batches of three, five, and even ten. The young larvæ from these have appeared to-day, and have begun to eat, some on the upper and some on the under side of the leaf. On May 27th and 28th, I took some fine specimens of *Lycæna bellargus*; the former day was somewhat dull, and the insects could be pill-boxed easily as they rested on the stems of the grasses. On May 29th *Argynnis euphrosyne* was about on Ranmore Common, but was somewhat wild and difficult of capture. On several occasions during the month I have come across broods of fifty or sixty larvæ of *Vanessa urticae*, and some that I took began to pupate to-day. —F. A. OLDAKER; Parsonage House, Dorking, June 4th, 1901.

COLLECTING LEPIDOPTERA IN TANGIER.—The following is an account of four months' collecting in Tangier, from Jan. 1st till April 27th, 1900. The whole of January was brilliantly fine except for occasional gales of wind, and so my father and I could go out regularly. The insects out during January were *Pararge egeria* (a very red form), *Gonepteryx cleopatra* (hybernated), *Euchloë belemia*, *Vanessa cardui*, very fine and dark specimens, *Colias edusa* for the first fortnight of the month, and one *P. machaon* on the 19th, which seems very early. *Pieris brassicæ*, *P. rapæ*, and *P. napi* were all out in abundance, *P. napi* being the scarcest. *P. brassicæ* is very different to our English one, being half as big again; there were several pupæ of it on an outhouse. We also found several lappet-like larvæ feeding on two sorts of *Genista*, but they hatched into an egg, with great difference in the sexes; also a larva of *Acherontia atropos*, which died. *Macroglossa stellatarum* was common always, and *M. bombyciformis* was in fair numbers at the end of the month. *Vanessa atalanta* was common during February. I might perhaps describe the two places we caught most of our insects in. One was the end of our own garden, but it was a regular tangle of valerian, hawthorn, gladiolus, and other flowers, and had a ravine in it, with a stream at the bottom. Here we got every species we collected, except *Thestor ballus* and two sorts of *Cænonympha*, which were only obtained in open moorland country. The other place was a disused gravel-pit, overgrown with geranium and bordered by evergreens. "Blues" began to appear about the middle of February, *Lycæna argiolus* being common; but the weather at the end of February and the beginning of March was nearly always wet. On February 27th we caught our first *Thais rumina*, and continued to catch this species till the end of March, when it suddenly disappeared and gave no sign of being over, as the specimens we took were perfect to the end, and we hardly ever saw any rubbed or worn examples. On March 5th we saw some beautiful *Papilio podalirius* in a friend's garden, but they flew so high we could not catch them. The next day we caught a male *Euchloë eupheno*; all the males of this species come out much earlier than the females. The first example of the latter that we obtained was on April 1st. The under side of the hind wings is mottled with green, not marked with lines as in the European variety *euphenoides*. We also saw *Thestor ballus* on March 6th; *Gonepteryx rhamni*, too, was on the wing by this time. *E. belemia* was still out in

abundance, though there were "lulls" in its appearance. We caught *P. podalirius* on March 19th, and again on the 21st, when we also got *Polyommatus phlæas* and *Cænonympha pamphilus*. On March 23rd we got *Thecla rubi*—the specimens were in splendid condition—and also obtained *Hemerophila abruptaria*, *Phlogophora meticulosa*, and *Agrotis exclamationis* in the evening. On March 29th we got *Thestor mauritanica*. This species was extremely local, being found in a few square yards only. On April 4th my father rode to a lake about sixteen miles from our house and collected around it; he went to a place in which he had caught *Thestor ballus* eight years previously; the wind was blowing hard, but he managed to catch twelve specimens in fair condition. The next day we got *Lycæna bætica*, and a very dark olive female example of *Thais rumina*. On March 22nd we saw the females of *Gonepteryx cleopatra* depositing eggs on an evergreen shrub near the gravel-pit mentioned above; we took the eggs as she laid them, and brought them home; we also found two newly hatched larvæ two or three days later. The first larva hatched out on April 1st, and was in pupa by April 21st, and a fine male emerged on May 10th. The others did about the same. The caterpillar is grass-green, with a pale line down each side, and never changes much in colour from egg to full-grown. On April 8th my father saw a hybernated *Charaxes jasius* which is found here, but the fresh ones come out in August; it feeds on the arbutus. On April 13th we all went out to the "pig-sticking" camp, and took our nets and other appliances, but there was not much time for butterflying. The lamps at night attracted *Pseudophia tirrhæa*, *Arctia villica*, and a huge red eggar female in numbers; also *Agrotis saucia*; we caught *Catophia alehy-mysta* also.

I have now returned to England, having left Tangier on April 27th, and have heard from my father that he has caught *Chærocampa celerio* and *Saturni pyri*, some eggs of which I now have. It was really too early in the year for the majority of insects, but, nevertheless, it was very enjoyable collecting, and one could get excellent specimens of every sort. I found a lot of larvæ, which were very gregarious at first, but spread out when they grew older; they were black when small, and bright yellow hairs with long white hairs when full-fed. The have all pupated, but no imagines have yet emerged. I forgot to mention three varieties of the lappet-like larva—bright chestnut, dull brown, and grey, as in *quercifolia*.—G. MEADE-WALDO; care of P. Williams, Esq., Eton College, Windsor.

COLIAS HYALE AND VARIETIES OF SYRICHTHUS MALVÆ AND MELITEA CINXIA IN THE ISLE OF WIGHT.—Among my captures of Diurni in the Isle of Wight, during Whit-week, were a perfect specimen of *Colias hyale*, one of *Syrichthus malvæ* (*alreolus*) var. *taras*, and a striking variety (a male) of *Melitæa cinxia*.—R. S. MITFORD; 35, Redcliffe Square, South Kensington, June 20th, 1901.

LEPIDOPTERA IN THE NEW FOREST AT WHITSUNTIDE.—Three days' collecting at Lyndhurst, with Mr. A. D. Wilson, of Fife, produced satisfactory results. *Argynnis euphrosyne* and *Gonepteryx rhamni* swarmed all over the forest, while *Thecla rubi* and *Nemeobius lucina* were abundant, the latter in Stubley Copse. As usual, *Macroglossa fuciformis* and *M. bombylififormis* were fairly common near the railway line at Wood Fidley. Among other moths taken were:—*Drepana falcula*, *D. unguicula*, *Lithosia aureola*, *Boarmia consortaria*, *Ligdia adustata*, *Macraria liturata*, *Thyatira batis*, *Dicranura vinula*, *Euclidia mi*, *Odontopera bidentata*, *Arctia mendica*,

Orgyia pudibunda, *Notodonta camelina*, *Hylophila prasinana*, *Tephrosia crepuscularia*, and *Eurymene dolobraria*. We spent most of the time in beating and searching for larvæ, and, although we were unfortunate this year in not securing a single larva of *Apatura iris*, we obtained, however, a great many larvæ, including *Thecla quercus*, *Catocala sponsa*, *C. promissa*, *Tæniocampa miniosa*, *Cymatophora ridens*, *Bombyx neustria*, *Dicranura vinula*, *Liparis monacha*, *Amphidasys prodromaria*, *Cleora glabraria*, *C. lichenaria*, *Pæcilocampa populi*, *Hylophila bicolorana* (four), *Triphæna fimbria*, *Noctua brunnea*, *Agriopsis aprilina*, *Nyssia hispidaria*, *Geometra papilionaria*, *Limenitis sibylla*, and a nest of very small *Vanessa polychloros*.—H. O. WELLS; Hurstfield, The Avenue, Gipsy Hill, London, June 10th, 1901.

NOTE ON *MACROGLOSSA FUCIFORMIS* AND *M. STELLATARUM*.—I believe that *M. fuciformis* is generally looked upon as somewhat rare in this neighbourhood. On June 8th and 9th I saw the species in some abundance on the side of the road in Worth Forest, hovering over *Ajuga reptans* (bugle); the moths were very easy to catch. To-night, June 22nd, at 8.20 p.m., *M. stellatarum* visited our garden. Is not this rather a late hour? Would any of your readers be kind enough to tell me of any locality in Surrey or Sussex where I might obtain one or two *Melitæa athalia*?—HERBERT BEADNELL; Fernside, Redhill, Surrey, June 26th, 1901.

COLIAS HYALE IN JUNE.—I took a specimen of *C. hyale* at Wicken on June 22nd last, evidently newly emerged, as it was beautifully fresh, although one hind wing was broken, probably by the gale that was blowing at the time.—H. W. SIMMONDS; 66, Sydney Street, Chelsea, S.W., June 26th, 1901.

On June 14th last I took a perfectly fresh specimen of *Colias hyale* near here. From its appearance I am satisfied that it could not have hibernated as a butterfly. It is worthy of notice that I have now taken *C. hyale* in this neighbourhood three years in succession. I took four specimens in 1899; last season they were very common, and now this specimen. I have never before taken it earlier than August.—H. HUGGINS, JUN.; 13, Clarence Place, Gravesend, June 25th, 1901.

LARVÆ AND PUPE OF *PLUSIA MONETA* IN KENT.—On June 5th I had an opportunity of spending an afternoon in the beautiful garden of my mother's home at Bidborough, near Tunbridge Wells. While admiring the luxuriance of a particularly fine herbaceous border, I was struck by the unusual appearance of one of the leaves on a plant of *Delphinium*, and a closer scrutiny was rewarded by the discovery of a nearly full-grown larva of *Plusia moneta*. Further search revealed three more larvæ, and no less than twenty-four cocoons of a rich golden silk, which were attached to the under surface of the leaves. During the last few years that I have lived at Bidborough, I have always searched the same plants indefatigably, but in vain; so that it is the more curious that I should have been successful on the occasion of a flying visit like the present.—H. W. SHEPHEARD-WALWYN; Dalwhinnie, Purley, Surrey.

PLUSIA MONETA IN SUSSEX.—While out nothing about nine o'clock in the evening on Wednesday, June 27th, I caught a specimen of *P. moneta* on a syringa-bush.—(Miss) GLADYS TEDDEN-FISHER; Apsleytown, East Griinstead, Sussex.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—*June 5th, 1901.*—The Rev. Canon W. W. Fowler, M.A., President, in the chair.—Mr. G. C. Champion exhibited a male specimen of *Odontæus mobilicornis*, one of the rarest of British beetles, captured at Woking on May 28th. Mr. Donisthorpe said that the same species had also been taken this year at Bournemouth by Mr. and Mrs. Jackson.—Mr. R. McLachlan exhibited four specimens of a curious bug of the genus *Henicocephalus*, received from Mr. G. V. Hudson, of Wellington, New Zealand; he thought the genus, although of very wide distribution, had not previously been noticed in that country. Mr. Champion said that *Henicocephalus* was generally recognized as a type in itself of a family, and Mr. Kirkaldy that it was much commoner than generally supposed. It was probably only an aberrant form of the Reduviidæ having no stridulating apparatus on the prosternum.—Mr. C. P. Pickett exhibited a series of *Smerinthus tiliæ*, bred during May, 1900 and 1901, including one male specimen having the right upper wing banded, the left wing with the two ordinary spots; a banded female; a male with only one spot; and a richly coloured female.—Mr. C. G. Barrett exhibited imagines, cocoons, pupa-skins, and also water-colour sketches of larvæ, reared and drawn by Miss Frances Barrett, at Buntingville, Pondoland, South Africa, including *Hesperia keitloa*, *Leucaloe eugraphica*, *Liparis pulvereæ*, *Lenodora montana*, *Trabele ochroleuca*, *Chilena prompta*, *Braura ligniclua*, *Eutricha pithyocampa*, *Dulichia fasciata*, *Porela sobria*, *Rhanidophora phedonia*, *Sphingomorpha chlorea* (*monteironis*).—Dr. A. Jefferis Turner exhibited specimens of Australian wood-boring Lepidoptera belonging to four different families. They included—Pyralidæ: *Doddiana xyloryctis*, Turn. Gelechiidæ: *Cryptophasa flavolineata* and *C. hemipsila*, Turn., *Maroga mythica*, Meyr., *M. setiotricha*, Meyr., *Uzucha borealis*, Turn. Cossidæ: *Dudgeona actinias*, Turn., *Xyleutes pulchra*, Roths., *X. macleayi*, *X. nephocosma*, Turn. Hepialidæ: *Charagia mirabilis*, Roths., *C. ramsayi*, Scott, and *C. cyanochlora*, Lower.—Mr. H. Goss exhibited, for Mr. Ernest Ardron, of Colombo, Ceylon, two specimens of a species of *Phyllium* (Phasmidæ). They bore an extraordinary resemblance to leaves. He also showed three varieties of the male of *Melitæa cinxia*, which he had taken on May 27th and 28th at Niton, Isle of Wight.—Mr. C. O. Waterhouse exhibited two new genera and species of Coleoptera, recently described by him in the Ann. and Mag. Nat. Hist., from Rio Janeiro. One belonged to the aberrant Prisnidæ (*Pathocerus wagneri*); the other (*Tetraphalerus wagneri*) belonged to the Cupesidæ, and was remarkable for the form of its head. He also exhibited male and female of the curious Scarabæid, *Glyphoderes sterquilinus*, West., from North Argentina.—Mr. H. St. J. Donisthorpe exhibited a glove burnt by discharges of formic acid in the nests of *Formica rufa*. In connection with the apparatus exhibited at the last meeting to determine the strength of this acid, Professor Poulton said that the discharges collected in the tubes fluctuated greatly in strength, the strongest yielding a proportion of sixty to seventy per cent. of anhydrous acid, a drop of which placed by Mr. Holroyd on the back

of his hand left a distinct scar some days after the application. The discharge of *Dicranura vinula* showed a strength of about forty-five per cent.; and Mr. F. Merrifield remarked that in breeding the larvæ of that species the acid liberated by them left a yellow stain on the lino, making it rotten.—Mr. W. Schaus communicated “A Revision of the American Notodontidæ,” and Mr. H. St. J. Donisthorpe read a paper on “Cases of Protective Resemblance, Mimicry, &c., in British Coleoptera.”—H. ROWLAND-BROWN, *Hon. Sec.*

SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—April 25th, 1901.—Mr. H. S. Fremlin, F.E.S., President, in the chair.—The evening was devoted to a special lecture by Mr. R. Kearton on “Wild Life in Nature,” illustrated by a large number of original lantern-slides.

May 9th.—The President in the chair.—Mr. Step exhibited a number of living specimens of the fungus-inhabiting coleopteron, *Mycetophagus quadripustulatus*, from the banks of the Brent.—Mr. Kemp, between seventy and eighty cases made by larvæ of caddis-flies (Trichoptera) of the genera *Phryganea*, *Limnophilus*, *Sericosoma*, *Anabolia*, and *Molanna*, from the neighbourhood of London and Oxford; numbers of examples were composed wholly or partly of fresh-water shells.—Mr. Enoch, living nymphs of *Anax imperator*, *Æschna cyanea*, *Brachytron pratense*, *Calopteryx splendens*, and *Erythromma najas*, from the Black Pond, Esher, and Byfleet.—Mr. Edwards, a species of trap-door spider from Jamaica, together with its nest; a large species of dragonfly from Bogota; and a specimen of the lantern-fly, *Fulgaria latenaria*.—Mr. Lucas, specimens of the so-called fresh-water limpet, *Ancylus lacustris*, from the canal near Byfleet.—Mr. Clark, photographs of the ova of *Tæniocampa stabilis* and *Ennomos tiliaria*.—Mr. Turner, a living nymph of *Anax imperator*.—Dr. Chapman, living specimens of *Thais polyxena*, bred from larvæ taken in the South of France.—Mr. Fremlin, several cultures of bacteria obtained from the dead pupæ exhibited by Mr. Adkin several meetings ago. A discussion ensued.—Mr. W. Bateson, F.R.S., gave an address on “Recent Advances in the Study of Heredity,” and exhibited numerous specimens in illustration.

May 23rd.—Mr. W. J. Lucas, B.A., Vice-President, in the chair.—Mr. Robert Adkin, living examples of the coleopteron, *Pyrophorus noctilucus*, from Jamaica, and contributed notes.—Mr. F. M. B. Carr, a large number of species of Lepidoptera taken or bred this year, mainly from the New Forest, including *Drymonia chaonia*, *Anticlea nigrofasciata*, *Cidaria psittacata*, *Asphalia flavicornis*, *H. ridens*, &c.—Mr. Step exhibited a considerable number of lantern-slides illustrative of his address on “Spring Notes.” Some were from photographs taken at Oxshott during the Society’s Field Meeting.—HY. J. TURNER, *Hon. Rep. Sec.*

RECENT LITERATURE.

Economic.—L. O. HOWARD describes "The Principal Insects affecting the Tobacco Plant" (Farmers' Bull. 120, U. S. Dept. Agriculture, 1900, pp. 1-32, 25 text figures); and J. B. SMITH discusses "The Role of Insects in the Forest" (1900, Ann. Rep. State Geol. New Jersey for 1899, pp. 205-32, 9 figures).

Economic.—*The Proceedings of the 12th Annual Meeting of the Association of Economic Entomologists* (held in New York City last June) contain, as usual, a number of reports and notices of general interest.

C. M. WEED describes the oviposition of an egg-parasite of *Eu-
vanessa antiopa*. "*Antiopa* was seen ovipositing on *Salix*. After laying about twenty eggs she flew away. The moment she left a small hymenopteron—*Telonomus graptæ*, Howard—was seen running over the eggs. The parasite was watched for the next half-hour, during which time it oviposited in fifteen eggs. Does the parasite ride around on the butterfly, waiting for oviposition?"

A. H. KIRKLAND reports on the Brown-tail Moth (scientific name not given, but presumably *Porthesia chrysorrhæa*) in Massachusetts. The insect was first noted in the State in 1897, but it was possible to ascertain the affected area in 1896, and this was computed at 29 square miles; in 1897 this had increased to 158 square miles, to 448 in 1898, and to 928 in 1899! It has now passed the borders of Massachusetts into New Hampshire and Maine (1900, Proc. 12th Ann. Meeting Assoc. Economic Entom.—U. S. Dept. Agriculture. Division Entom. (n. s.), Bull. 26, pp. 1-102, 2 plates and 1 text figure).

G. W. K.

Economic.—E. DAGUIN. *Les Insectes Comestibles dans l'antiquité et de nos jours* (Paris, 1900, pp. 1-29).

THIS interesting but somewhat fantastic brochure is a reprint, in different form, from the series of articles running some little while ago in 'Le Naturaliste.' Commencing with a discussion on the propriety of the word "insecte" being applied to a crustacean or a spider, the author proceeds to dilate on the gustible properties of the latter. We have already (1900, p. 87) cited the passage in which the celebrated Lalande's passion for the succulent Arachnid was described; Labillardière tells us that *Epeira novæ-hollandiæ*, Walck., is devoured by the aborigines of Australia. We ourself have experimented in this way on caterpillars, waterbugs, locusts, and aphides, but have not yet extended our researches to spiders. Krachenninikov asserts that the women of Kamtskatka, who desire to be blest with children, eat spiders. The culinary properties of various coleopterous, lepidopterous larvæ, of locusts, and so forth, are discussed at some length. With regard to locusts, the reviewer has eaten them; it may possibly have been the fault of the method of the preparation, but to his mind they cannot be

referred to as table delicacies, for they resemble in taste shrimps dipped in train-oil, and powdered with coal-dust! The author concludes:—"Man *can* eat insects: nothing in his anatomical organization nor in his physiological functions prevents it. Man *ought* to eat insects: first, because his cousins the monkeys, and his remote kinsmen the bats, in a word the *primates* [sic!], eat them; second, because insectivorous animals outstrip the other kinds (*espèces*) of their order both by their more perfect organization, and by the excellence of their intelligence"!!

G. W. K.

Die Geradflügler Mitteleuropas von Dr. R. Tümpel. Eisenach, 1901.

STUDENTS of nature owe their gratitude to Dr. Tümpel for adding to the comparatively scanty list of books devoted to orders of insects that have long been much neglected, but which nevertheless are in many ways closely connected with the well-being or otherwise of man, and the success or failure of his undertakings.

Dr. Tümpel's work has been appearing in parts for some time, and now in a complete form we have a quarto volume of some 300 pages treating in a comprehensive manner of the Neuroptera, Orthoptera, and Thysanoptera of Central Europe.

After full introductions to the various subdivisions of the orders treated, we have a short description, &c., of the various species. Of the twenty-three plates, most of them printed in colours, the majority are excellent, the Orthoptera being perhaps on the whole rather better than the Neuroptera, though we think the Corduline and Gomphine dragonflies particularly good. Some of the smaller dragonflies should have been magnified. Plate xii., giving figures of a dozen dragonfly nymphs, is hardly satisfactory—the shape of the abdomen of *Libellula depressa* and the length of the legs of *Cordulia aenea* will make identification difficult; while the nymph named *Agrion puella* should probably be *Erythromma najas*.

W. J. L.

OBITUARY.

It is with regret we have to record the death, on May 13th, 1901, of Monsieur ALEXANDRE CONSTANT, who was well known as a thorough entomologist. He described many new species of Micro-Lepidoptera, but took little interest in the larger species. Monsieur Constant lived in a pretty villa at Golfe Juan, near Cannes, though he usually spent a part of the year in Corsica, or other parts of France. His garden, in which he took a great interest, was planted with many beautiful palms and other plants. He was a member of the Entomological and Botanical Societies of France, and formerly President of the Horticultural Society of Cannes. His death took place suddenly at his Villa Niobé. He was in his seventy-second year, and leaves a widow.

J. C. W.

THE ENTOMOLOGIST

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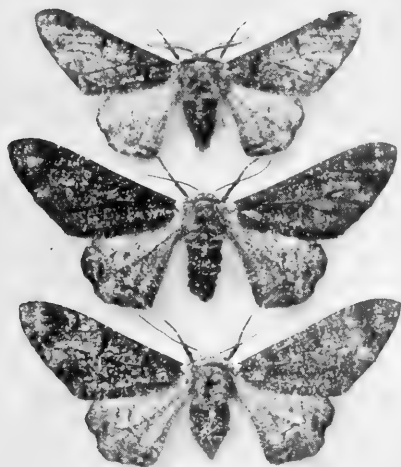
AUGUST, 1901.

[No. 459.]

INTERMEDIATE FORMS OF *AMPHIDASYS BETULARIA*.

BY FRANK LITTLEWOOD.

THE accompanying illustrations represent varieties of *A. betularia* recently bred by myself. On the night of August 15th last year I discovered sixteen almost full-fed larvæ of this species



feeding on a plum-tree in my garden. They were by no means easy to see on account of their exact resemblance to the twigs of the plum, and I wish now that I had given the tree a more thorough search. Knowing it to be a somewhat variable species, I took as many as I could find, and fed them carefully for the

few remaining days of their larval life, when all pupated successfully. In the beginning of December I placed them along with other pupæ to force in a moderate heat—about 70°. The pupæ lay on dry soil, a damp cloth placed over the muslin-covered lid



keeping the air within the box sufficiently moist. The first example to emerge was a male on Jan. 5th, and others continued to come out at intervals until March 1st. This in itself is to me a curious point. When a number of larvæ of the same age pupate together, are put to force together, and are subjected to the same temperature, why should one moth take as much as two months longer to develop than another? Out of sixteen pupæ I bred fourteen (nine males, five females) perfect imagines, and two (one male, one female) whose wings never developed. With the exception of one male, which is as near as possible var. *doubledayaria*, all the specimens are of a distinct intermediate form between type and var. *doubledayaria*. Not one approaches nearly that form generally recognized as the type. Does this point to parents of opposite forms—one type, the other var. *doubledayaria*; or to typical parents, each more than usually dark, and producing still darker descendants?

The fore wings are thickly speckled with black scales, in some parts so closely as to form blotches, especially towards the tip and around the hind margin. Throughout the lighter portions of the wing the nervures show up distinctly black. The hind wings are dark round the hind margin, becoming gradually lighter towards the base. The body is about evenly speckled with black and white, although in two of the specimens it is almost entirely black.

The wide intervals which occurred between the emergences of my specimens made it impossible for me to attempt pairing in captivity; while the early date, occasioned by forcing,

prohibited sembling with the females, and I regret that I was thus unable to breed from my stock. Of the two forms of *A. betularia*, the var. *doubledayaria* occurs in this district by far the most frequently. The earliest record of the capture of *doubledayaria* was about the year 1870.

We are, here, in fine open country, far removed from the smoke of a manufacturing town, consequently the tree trunks preserve their natural variety of colour.

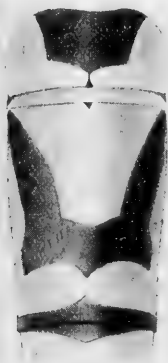
I should mention that the three specimens were photographed natural size, and the other eight reduced about half.

Lynn Garth, Kendal: May 30th, 1901.

AGRION PULCHELLUM, VAR., RESEMBLING *A. PUELLA*.

By W. J. LUCAS, B.A., F.E.S.

NORMALLY in this species the characteristic spot on the dorsal surface of the second segment of the abdomen consists of a U, strongly connected with the black circlet posterior to it. Occasionally the connection is weaker, and in a specimen before me, taken at the Byfleet Canal on June 26th last, it is absent (*vide* figure), causing the insect at first sight to resemble a male



Agrion pulchellum, ♂ ab. Dorsal surface of segments 1 and 2, much magnified.

of *Agrion puella* (cf. Plate II., *ante*, figs. 1 and 2). That it is not really *puella* may be known by the posterior margin of the prothorax, the divided humeral blue stripes, and the shape of the anal appendages. This form has occasionally been noted before (*vide* De Selys' 'Revue des Odonates,' p. 198, and my 'British Dragonflies,' p. 280), but in places where both species fly together, as at Byfleet Canal, this uncommon variety of the less frequent species might easily be passed over for a typical *puella*.

Kingston-on-Thames.

ON LABELLING INSECTS.

By T. B. FLETCHER, R.N., F.E.S.

MR. BRUNETTI's article on labelling (*ante*, p. 172) will appeal to every entomologist, whatever his particular speciality. There are of course some who do not label their captures at all, either because "it is too much trouble," or because they think "labels spoil the appearance of the collection"; but the number of these is happily becoming every year small by degrees and beautifully less, and to them my remarks are not addressed. Everyone else will agree that labelling is not only useful, but absolutely essential; but at the same time, as Mr. Brunetti says, there is a great lack of uniformity in the matter, for each has his own particular method. The question then is—what is the best system?

The ideal method would doubtless be to have attached to every specimen its full history, *i.e.* the zoo-geographical region, country, district, and place of capture, the date (day, month, and year), climatic conditions (height above sea-level, temperature, nature of soil, vegetation, &c.), habits, name of collector, &c.; but in practice it will be found that this cannot be carried out. The modified method which I use is as follows:—

I have a book in which all acquisitions are entered under the headings of Number, Name and Sex, Date, Locality, and Remarks. Examples:—

| No. | NAME. | DATE. | LOCALITY. | REMARKS. |
|------|---------------------|----------------|------------------------------|---|
| 4050 | Bapta temerata | 6. June. 00. | Torpoint, Cornwall, England. | Beaten from a hedge. Only one seen. |
| 4098 | Callophrys rubi ♀ | 23. April. 01. | Argostoli, Greece. | Only one seen; very worn. |
| 4129 | Ægeria apiformis ♂ | 27. April. 01. | Nauplia, Greece. | Common on poplar trunks on the road to Tiryns; mostly low down on the trunk. Found about twenty pupa-cases (emerged), almost all very low down on north or east side of the tree. |
| 4195 | Cyaniris argiolus ♂ | 3. June. 01. | Suda Bay, Crete. | Fairly common sporting round plane trees. No females seen or beaten. |

Each specimen thus has a distinguishing number, which, with the principal particulars (country, locality, and date), is placed on the label, which is itself attached to the specimen. The labels would then read:—

| | | | |
|---|---|---|--|
| 4050 Anglia. Cornwall. 6. vi. 00. * | 4098 Grecia. Argostoli. 23. iv. 01. * | 4129 Grecia. Nauplia. 27. iv. 01. * | 4195 Creta. Suda. 3. vi. 01. * |
|---|---|---|--|

It will be noticed that these labels are longer and narrower than Mr. Brunetti's, so that the most important particulars project well in front of the specimen and are easily read; by turning to the catalogue any further details may be at once seen.

With Mr. Brunetti's remarks on the method of writing the date I am quite in accord; to place the month before the day is like putting the cart before the horse. The use of Roman numerals to further distinguish the month is an excellent scheme, and if collectors cannot bring themselves to do this, they should at least write Jan., Feb., Mch., &c.

The collector's name hardly seems necessary unless there are large acquisitions by exchange or purchase; but a note in the remarks column of the catalogue, or a second label on the insect, would serve the purpose.

I am, of course, aware that there are many other methods. Some only attach catalogue numbers to the specimens, but this entails reference to the catalogue in every case, whereas my method only requires such reference when full details are required. Others place their labels beside their specimens, so as to be clearly seen, and so that one label will do duty for all captures on one occasion; but this is only of advantage when the limits of a collection are well marked out; otherwise it means the constant trouble of shifting the label also whenever a specimen is moved, and if the specimens should get separated from their labels, it seems to me that there might be considerable difficulty in pairing them off again.

In conclusion, without wishing to assert that my method is the best possible, I do say that it answers very well, and possesses the following advantages:—

(1). The labels can easily be read without removing the specimen; thus a great factor in deterioration is absent.

(2). If it does require to be taken out of its box for comparison, exhibition, &c., each specimen is complete in itself, and so there is no danger of its data being lost.

(3.) By means of the catalogue number a large amount of information about habits, &c., may be jotted down at the time when fresh in the memory, and is always ready to hand.

H.M.S. "Gladiator," Mediterranean Station :
10th June, 1901.

ON THE NOMENCLATURE OF THE GENERA OF THE RHYNCHOTA, HETEROPTERA AND AUCHENORRHYNCHOUS HOMOPTERA.

By G. W. KIRKALDY, F.E.S.

(Continued from p. 179.)

? 1834 [1832-5.] WESTWOOD, Zool. Journ. v. 445-7 (a) *Dero-ploa* t. *parva*; *Platydius*⁹² t. *subpurpurascens*; *Opistoplatys* t. *australasiæ*.

1834. GUERIN, Ins. Voy. Belanger, 441-80 and 497-502. (a) *Eurybrachys* t. *lepeletieri*; *Eumallia*⁹³ t. *variegata*; [Atlas, pl. 3 & 4, fig. 3. (β) *Euryptera*⁹⁴ t. *obscura*]. BURMEISTER, Ent. Rev. ii. 1-26. (a) *Pseudaradus*⁹⁵ t. *brevicornis*; *Merocoris*⁹⁶ t. *merianæ*.⁹⁷ (β) *Asopus*.⁹⁸ HAHN, Wanz. Ins. ii. [Feb.] 33-60. (a) *Tectocoris* t. *cyanipes*; ⁹⁹ *Chrysocoris* t. *stollii*; ¹⁰⁰ *Globocoris*¹⁰¹ t. *globus*¹⁰² *Tropicoris*¹⁰³ t. *rufipes*; *Empicoris* t. *variolosus*; *Ursocoris*,¹⁰⁴ types *dorsalis* + *fuliginosus*.¹⁰⁵ (β) *Ventocoris*, *Bellocoris*.¹⁰⁶ (γ) *Thyreocoris*, 1801, t. *scarabæoides*; ii. [May] 61-80. (β) *Clinocoris*, *Eysarcoris*; ii. [July] 81-100. (a) *Paracoris*¹⁰⁷ t. *paradoxus*. (β) *Cyllecoris*. WESTWOOD, Ann. Soc. Ent. France, iii. 642. (a) *Microphysa* t. *pselaphiformis*. DUFOUR, l. c. 341-57. (a) *Cephalocteus* t. *histeroides*. (δ) *Postemma*, 1832. WESTWOOD, l. c. 637-53. (a) *Microvelia* t. *pygmæa*. HAHN, Wanz. Ins. ii. [Oct.] 101-22. (a) *Acinocoris* t. *calidus*. (β) *Merocoris*,¹⁰⁸ *Arenocoris* [*Cydonus*].¹⁰⁹ BURMEISTER, Meyen's Reise [March 12] Abh. 6; Ins. 285-806 [Act. Ac. Caes. Leop. Carol. xvi. Suppl. 403-80]. (a) *Dasynus*¹¹⁰ t. *coccocinctus*; *Loricerus* t. *hæmatogaster*. (β) *Cerbus*. (δ) *Amaurus* for *Pseudaradus*, 1834, *Ceptocris* for *Leptocoris*, 1833.

⁹² = *Megymenum*, 1830.

⁹³ Homotyp. *Phenax*, 1833.

⁹⁴ Invalid, not described; also preoccupied.

⁹⁵ = *Megymenum*, 1830.

⁹⁶ Preocc. Perty, 1830-2.

⁹⁷ = *meriani*, Fabr.

⁹⁸ = *Discocera*, 1832, + *Stiretrus*, '32.

⁹⁹ = *lineola*, Fabr., var.

¹⁰⁰ = *stollii*, Wolff.

¹⁰¹ Homotyp. *Coptosoma*, 1832.

¹⁰² = *scutellatus*, Fourcr.

¹⁰³ Homotyp. *Pentatoma*, 1789.

¹⁰⁴ Homotyp. *Odontoscelis*, 1832.

¹⁰⁵ Both are vars. of one species.

¹⁰⁶ *Odontotarsus* + *Eurygaster*, 1832.

¹⁰⁷ = *Pendulinus*, 1822.

¹⁰⁸ Preocc. Perty, 1830-2, and Burm. 1834.

¹⁰⁹ Not described.

¹¹⁰ = *Pendulinus*, 1822.

1835. LEWIS, Trans. Ent. Soc. Lond. i. 47-52. (α) *Idiocerus t. stigmatalis*; ¹¹¹ *Batrachomorphus* ¹¹² *t. irroratus*. ¹¹³ (β) *Macropsis*. (γ) *Bythoscopus*, 1833, *t. lanio*. BOISDUVAL, Voy. Astrolabe, Zool. pt. ii. Coleopt. &c., 60946. (α) *Brachyplatys t. vanikorensis*. (β) *Astacops*. (δ) *Alidus*, 1803; *Næmatopus*, 1825. H.-SCHAFER, Nomencl. Ent. 35-116. (α) *Dicranomerus* ¹¹⁴ *t. nugax*. HAHN, Wanz. Ins. [Aug.] iii. 1-16. (α) *Stenogaster t. tardus*. ¹¹⁵ GERMAR, Rev. Ent. iii. 223-61. (α) *Hypsauchenia t. ballista*. (δ) *Entilia*, 1833; *Heteronota*, 1832; *l. c.* 307-11. (α) *Lycoderes t. ancora*. BURMEISTER, Handb. ii. 99-396. (α) ^{115a} *Dorydium t. paradoxum* ^{115b}; *Machærota t. ensifera*; *Umbonia t. spinosa*; *Polyglypta t. costata*; *Cyphotes t. nodosa*; *Hynnys t. rosea*; ¹¹⁶ *Pterodictya t. ephemera*; *Bothriocera t. tinealis*; *Hemidictya t. frondosa*; *Notocyrtus* ¹¹⁷ *t. clavipes*; *Tiarodes* ¹¹⁸ *t. versicolor*; *Oncocephalus t. squalidus*; *Labops t. diopsis*; ¹¹⁹ *Harmostes t. dorsalis*; *Actorus* ¹²⁰ *t. fossularum*; *Chlænocoris t. impressus*; *Cyptocoris t. lundii*. (β) *Colpoptera*; *Myocoris*; *Euagoras*; *Spiniger*; *Holotrichius*; *Pseudophleus*; *Discogaster*; *Homæocerus*; *Colobathristes*; *Hypselopus*; *Paryphes*; *Physomerus*; *Dinocoris*; *Sphærocoris*; *Pachycoris*; *Augocoris*; *Archimerus* for *Pachymeria*, 1832; *Largus* ¹²¹. (γ) *Cælidia*, 1821, *t. venosa*; *Stegaspis*, 1833, *t. fronditia*; *Otiocerus*, 1819, *t. stollii*; *Cerbus*, 1834, *t. umbilicatus*; *Acocephalus* [recte *Acucephalus*], 1833, *t. striatus*; *Ptyelus*, 1825, *t. ferrumequinum*; ¹²² *Spartocera*, 1832, *t. geniculata*; *Cymus*, 1832, *t. clavivulus*. (δ) *Euacanthus*, 1825; *Aethalia*, 1810; *Cixia*, 1804; *Caloscelis*, 1833; *Pseudophana* for *Dictyophora*; *Pæocera*, 1832; *Aphana*, 1830; *Belostomum*, 1807; *Hydroessa* for *Microvelia*, 1833; *Limnobates* for *Hydrometra*, 1796; *Macrops* ¹²³ for *Macrophthalmus*; *Hammato-cerus* for *Hammacerus*, 1832; *Ectrychotes* for *Ectrichodia*, 1825; *Phyllomorphus*, 1832; *Pirates*, 1831; *Crinocerus* for *Acanthocerus*, 1805; *Phyllocephala*, 1832; *Meropachys*, 1832; *Cephalocterus* for *Cephalocteus*, 1834; *Oncomerus*, 1832; *Megalymenum*, 1830; *Phlæocoris* for *Phlæa*, 1825; *Peltophora* for *Scutiphora*, 1830; *Atelocerus*, 1832; *Callidea*, 1832; *Spartocerus*, 1832; *Tessera-toma*, 1825.

¹¹¹ = *adustus*, H.-S.

¹¹² = *Bythoscopus*, 1833.

¹¹³ = *microcephala*, H.-S.

¹¹⁴ Homotyp. *Stenocephale*, 1825.

¹¹⁵ = *lavateræ*, F.

^{115a} Homot. *Cephalelus*, 1832.

^{115b} = *infumatus*, Perch.

¹¹⁶ = *degeeri*, Kirby.

¹¹⁷ Attributed to Hoffmannsegg;
vide 1817.

¹¹⁸ Homotyp. *Cimbus*, 1832.

¹¹⁹ = *sahlbergii*, Fall.

¹²⁰ Homotyp. *Micrellytra*, 1832.

¹²¹ = *Euryophthalmus*, 1832.

¹²² = *flavescens*, Fabr., var. *olivacea*, Fabr.

¹²³ Preocc. Perty, 1830.

(To be continued.)

NOTES ON LEPIDOPTERA FROM THE MEDITERRANEAN.

BY T. B. FLETCHER, R.N., F.E.S.

SOME little time ago Messrs. G. F. Mathew and P. de la Garde published in the 'Entomologist' (xxx. 77 *et seq.*, and xxxi. 8) a list of Lepidoptera captured on the Mediterranean Station, which proved so interesting to me that I have been led to hope that a list of my own captures out here may prove as interesting to others, more especially as of late years there seems to have been a considerable increase in the study of extra-British species. The present paper covers the worst portion of the year, so there are few captures noted; but I intend, if the Editor will allow space, to continue to record the species met with from time to time.

We left England on October 18th, and arrived at Gibraltar on the 23rd, coaling the same day, and leaving early next morning. I did not land, but a specimen of *Agrotis segetum* came on board to light in the evening.

We arrived at Nauplia, in Greece, on the 28th, and stayed there ten days. On November 1st I went ashore and walked out to Argos; it was a blazing hot afternoon, and a long and dusty road. Everything seemed burnt up after the summer heats, but there were several butterflies about, including *Danaus chrysippus*, *Pyrameis cardui* and *atalanta*, *Eurymus (Colias) edusa*, *Pieris brassicæ*, and several little "blues" and *Cænonymphas*. A *Macroglossa stellatarum*, also, which had been rash enough to fly on board, was caught and brought to me. On November 6th we left for Malta, arriving next day, and stayed till the 17th, when we left again for a cruise in the Levant. On the 19th, when off Crete, another *M. stellatarum* came on board; we were a good twenty-five miles distant from land, but this seems a species with a strong predilection for wandering, and great powers of long and sustained flight.

On November 21st we arrived at Limasol, in Cyprus, and next day I landed with a net to see what was to be found on the wing. It was rough walking, there being practically no path, and the fields full of dead and burnt-up thistles and other plants even more prickly; these composed practically all the undergrowth, though there were numbers of scattered ilex trees. Further up, on the hills, there was more vegetation, a little grass and heath and clumps of bushes. Doubtless the country is green in the spring, but now everything was withered and scorched by the summer sun, and all the fields were bare, as the crops had been gathered in. Under these circumstances, butterflies were chiefly conspicuous by their absence, the only specimens seen being one *Pieris* and a few *Pyrameis cardui*—not a single moth or larva.

We left Limasol on the 23rd, and visited Larnaka, Beyrout,

and Alexandretta, but I saw no butterflies at any of these places. On December 1st we arrived at Ayas Bay, a large and shallow bay in the elbow of Asia Minor, opposite Alexandretta. Here *M. stellatarum* was again common about the ship. On the 4th I went ashore, but there were few butterflies, as the nights were now getting cold; the only species I saw were *P. cardui*, *E. edusa* (one), and a few little moths.

On December 8th we left for Alexandretta again, and then went on to Mersina, Smyrna, Deuthero, Salamis, and Suda Bay, arriving at Malta again on January 18th. During this time the weather was far too cold for insects; indeed, when we were at Deuthero, in Roumelia, the thermometer was hovering round the freezing-point the whole time, in spite of our being in the sunny Mediterranean.

On January 20th I walked out to Birzebbugia, at the south-eastern corner of Malta. It was a beautifully bright warm day, which had brought out all the lizards from their holes in the stone walls, but there seemed to be no Lepidoptera on the wing, except a few worn *Pyrameis cardui* and one *Nomophila noctuella*, though from the quantity of flowers about I should have expected more.

On January 26th we left Malta again for Plataea, in Greece, arriving there next day. This is a small harbour, with hills almost all round; these hills are covered with thick bushes and small trees, but the going is very rough indeed, as great jagged blocks of stone are scattered about everywhere. On January 30th I took *M. stellatarum* and *Orneodes hexadactyla*. February 2nd was a gloriously fine day, and I went off with a shooting-party out beyond the lakes, which are some four miles off. Almost at the first start-off I took a nice *Pararge egeria* var. *egerides* (the British, and not the South-European form), and along the path a couple of newly disclosed *Eurymus (Colias) edusa*; there were several *Pyrameis cardui* about, and *P. atalanta* was quite common, especially near the lakes; the *cardui* were mostly worn, but the *atalanta* quite fresh. On February 7th I saw a fine *Colias (Gonepteryx) cleopatra* in addition to the foregoing species, but after this we had a spell of dull, wet, and windy weather, which seemed to put everything back, for I saw nothing new.

On February 18th we left for Zea, a little island about fifty miles south-east of Athens. It is very steep and rocky, and rather bare, and there is little undergrowth, but some almond trees, which were now in bloom, attracted the few butterflies about—principally *P. atalanta*. *M. stellatarum* was very abundant, and I spent a long time one afternoon trying to "kodak" a specimen feeding on the wing; by the way, very little seems to have been done in this direction—i. e. the photographic portrayal of insects in their natural environment—though, of course, the subject is a difficult one.

From Zea we went to Volo, and then immediately returned to Malta, arriving on the 26th. *Pieris brassicæ* was now out, and, of course, *Pyrameis cardui* and *atalanta*, with the ubiquitous *M. stellatarum*. During March *Plusia gamma* was plentiful round the electric lamps ashore, and larvæ of *Lasiocampa trifolii* and *Calocampa exoleta* were common. On March 22nd *Pararge megæra*, *Cænonympha pamphilus*, and *Eurymus edusa* (newly emerged) were common. *P. brassicæ* was abundant, but worn, and *P. rapæ* just emerging, whilst I took one specimen of *Pontia daplidice*. At the end of March, also, *Phragmatobia fuliginosa* emerged from a cocoon found at Citta Vecchia. On April 5th the first *Polyommatus icarus*, with *Anaitis plagiata* and *Metoptria monogramma*, appeared on the wing, and on the 12th I saw the first *Chrysophanus phlæas*.

On April 18th we left Malta for Corfu, arriving there next day. On the 20th I landed with the net for a walk; everything seemed beautifully green after Malta, and there were quantities of flowers everywhere. The roads here are very good, being a relic of the British occupation, and are generally enclosed by a cactus hedge. Away from the town the trees are chiefly olive, which are not good for insects, but around the town there are many clumps of trees and bushes. Owing to the wind, butterflies were chiefly to be found in sunny sheltered corners.

Pyrameis atalanta.—One only. *P. cardui*.—In the most profuse abundance. There must have been thousands; frequently five or six were on the wing around me at once.

Nomiades cyllarus.—Two males only.

Plebeius baton.—One male only.

Polyommatus icarus.—One male of the ab. *icarinus*, Scriba.

Chrysophanus phlæas.—One only; blue-spotted form.

Leptidia sinapis.—One; very worn.

Pieris rapæ.—Not very common. *P. brassicæ*.—Abundant.

Eurymus (Colias) edusa.—Not very common; in the vineyards.

Plusia gamma.—One.

On the 22nd we left again for Argostoli, in Kephallenia, where "the sea runs into the land."

Pyrameis cardui.—Abundant, but in nothing like such abundance as at Corfu.

Satyrus mæra.—One female; very worn.

Callophrys rubi.—One female; very worn.

Nomiades cyllarus.—Two males.

Plebeius baton.—Fairly common.

Euchloë belia.—Fairly common, especially in meadows.

Hesperia malvæ.—Common.

Acontia luctuosa.—One.

Aspilates ochrearia.—Common.

Psyche unicolor (graminella).—Cases common. I found a male resting on a case from which a female emerged next day.

We left Argostoli on the evening of April 23rd, and did a couple of days at manœuvres, finally arriving at Nauplia. On the 27th I landed and walked out to Tiryns, where there are some very ancient ruins of immense size, and said to be pre-Hellenic. Here I found:—

Hipparchia semele.—One male; typical.

Cænonympha pamphilus.—Common and typical.

Vanessa egea.—One.

Pyrameis cardui.—Common.

Polyommatus icarus.—One male.

Eurymus edusa and *Pieris rapæ*.—Common.

Euchloë belia.—Common, and in very good condition. Easily distinguishable from *P. rapæ* on the wing, as it looks darker and the flight is swifter.

Achirus machaon.—One rather tattered specimen.

Spilothyrus altheæ and *Pamphila thaumas*.—One of each on the ruins at Tiryns.

Acontia luctuosa.—Common.

Ægeria apiformis.—Common on poplar trunks on the road to Tiryns. I found about a score of empty pupa-cases sticking out of the trees, all low down on the north and east sides. A couple of females I took oviposited freely; the ova are not attached in any way, and in nature are probably dropped promiscuously into the crevices of the bark.

On April 29th we left Nauplia for the Gulf of Patras for another series of manœuvres, and then back to Malta. On May 1st, when about one hundred miles from Greece, a couple of *Deilephila livornica* were caught on board and brought to me; of course, they may have flown on board the night before, though we had all lights out, but it is quite possible that they may have been migrating.

(To be continued.)

SOUTH AFRICAN COCCIDÆ.

BY T. D. A. COCKERELL.

THE Coccidæ here discussed form part of a collection sent to me by Mr. Claude Fuller, Government Entomologist of Natal. I had not meant to make any further study of African Coccidæ, except for purposes of comparison with American species, but I have not been able to resist investigating the interesting material sent unsolicited by Mr. Fuller, who, unfortunately, cannot find time to study it himself.

(1). *Monophlebus fulleri*, n. sp.—Maritzburg, Natal, on grass heads; uncommon.

♀. Length 7, breadth 3, height $2\frac{1}{2}$ millim., without cottony covering, but secreting some loose white cotton beneath at maturity;

conspicuously hairy, with long pale ferruginous bristles; salmon-pink when alive (Fuller), when dry very dark greyish (red by transmitted light), with three longitudinal keels covered with granular yellowish white secretion; the thickened margins and the under side also covered with white secretion, which is in large granules, presenting a peculiar appearance.

Boiled in liquor potassæ, turns it yellow; the three "cicatrices" described in *Walkeriana* are present, all elongated; eyes conical, very large and dark, placed immediately below and contiguous to the antennæ; mouth-parts small; body very densely covered with short hairs, together with short and long blunt hairs; long ordinary hairs interspersed along the lateral margins; femur and trochanter $850\ \mu$ long, tibia 120, tarsus (without claw) 460; tarsal digitules represented by a pair of bristles; inner side of tarsus and tibia with a row of remarkable hyaline spear-head-shaped spines, the same also taking the place of the claw digitules; tarsus curved, with a constriction on the upper edge which gives it the appearance of being two-jointed; antennæ apparently 10-jointed (club broken off in the example studied), joint 1 broader than long; 2 and 3 cylindrical, longer than broad; 4 and 5 short cup-shaped; 6 and 7 long cup-shaped; 8 and 9 fusiform; measurements of joints in μ :—(1) 90; (2) 120, and about 100 broad; (3) 114; (4) 80; (5) 80; (6) 80; (7) 90; (8) 100; (9) 100; (10) ?.

Penultimate stage.—Antennæ 8-jointed; 2 and 3 cylindrical as in the adult; last joint long and narrow, $165\ \mu$ long; body hairy like adult.

A distinct species, peculiar for the spear-head-like spines on the legs. Among the American species its nearest ally is *M. primitivus*.

(2). *Monophlebus fortis*, n. sp.—Richmond, Natal, under bark of *Eucalyptus*; only one found.

♀. Dark grey, distinctly segmented, mealy, posterior end covered with cottony secretion; sides with scattered long pale bristles; legs black. Length $5\frac{1}{2}$, breadth $2\frac{1}{2}$ millim.

Boiled in liquor potassæ, does not stain it. Hairy skin just as in *M. fulleri*, also legs, with the same spear-shaped processes, which are even better developed on the tibia. "Cicatrices" as in *fulleri*. Length of tibia about $1100\ \mu$, tarsus (without claw) about 580. Antennæ 11-jointed; measurements in μ :—(1) 150; (2) 150; (3) 150; (4) 110; (5) 110; (6) 110; (7) 110; (8) 130; (9) 120; (10) 120; (11) 160.

Very close to the last, but smaller, though certainly adult, and without the longitudinal white keels.

(3). *Dactylopius filamentosus*, Ckll., small variety.—On leaves of grass, Tongaat, Natal.

Antennal formula 732 (146) 5; joints in μ :—(1) 30; (2) 33; (3) 36; (4) 30; (5) 24; (6) 30; (7) 66. Tibia $90\ \mu$, tarsus 60.

Tinsley has reported this species from Richmond, Natal.

(4). *Pollinia ovoides*, n. sp.—Durban; gregarious on the branches of some tree.

♀. Scale a rounded conical object much like a lepidopterous egg, about $1\frac{1}{2}$ millim. diam., roughened radiately, pale brown with four longitudinal stripes of white secretion converging to the top of the scale, which is usually reddish.

♂. Scale elongated, about $\frac{2}{3}$ millim. long, roughened, yellowish or pink, with an oblique terminal cap.

♀. Scales soaked in liquor potassæ, give a deep orange-brown colour, and the insects themselves turn deep crimson; ♀ adult globose; skin with many simple round glands and tubular glands, and some figure-of-8 glands; anal ring with numerous hairs; caudal lobes prominent, conical, about $45\ \mu$ long, with a few small spines, and ending in stout bristles about $90\ \mu$ long; mouth-parts well developed, but small; labium short and broad, dimerous, the last joint with bristles on its margin; antennæ represented by small rounded tubercles about $15\ \mu$ long, with a little terminal prominence which appears to represent a second joint, and about six stout bristles about $18\ \mu$ long; spiracles small but distinct; legs wanting.

Embryonic larva with a row of figure-of-8 glands down each side, and dorsal and subdorsal rows of small round glands, the latter failing caudad, the last five glands of the dorsal rows being absent in the subdorsal; labium very short and broad, cup-shaped; form of insect elongate-pyriform; antennæ thick, 6-jointed, last joint not very greatly longer than the one before, and notched as in *P. pollini*.

A very distinct species.

(5). *Diaspis crawii*, Ckll., var. *fulleri*, n. var.—On twigs of *Melia azedarach* (called "syringa" in Natal), Maritzburg, Natal.

♀. Scale white, circular, 3 millim. diam., as in *crawii*, but exuviae conspicuous, pale ochreous to dark brown.

♀. Agreeing with *crawii* in the lobes, circumgenital and other glands, and other particulars, except that (1) the median lobes have the inner slope long, straight nearly to the base (in *crawii* obtusely angled about the middle), and conspicuously though minutely crenulate; and (2) the margin beyond the lobes is furnished with one, and then after an interval a group of seven very large spine-like squames. All the spine-like squames are very large. Circumgenital glands; median about 27, cephalolaterals about 57, caudolaterals about 31.

This appears to be only a variety of the Asiatic *D. crawii*. It is easily known from *D. pentagona* and *D. auranticolor* by the inequilateral median lobes, with a long inner slope.

(6). *Diaspis pentagona*, Targioni.—Pietermaritzburg, Natal; on peach.

(7). *Chrysomphalus rossi* (Maskell).—Durban, Natal; on presumed *Eucalyptus*.

(8). *Chrysomphalus phenax*, n. sp.

♀. Scale dark grey, resembling an oyster, with the sublateral exuviae shining black. ♀. No circumgenital glands; anal orifice

small, about $9\ \mu$ long, oval, about $63\ \mu$ from bases of median lobes; lobes four, crenulate, shaped as in *C. mimosæ*, but the median lobes are broader, angular instead of sloping on the outer side; margin beyond the lobes denticulate and finely crenulate; club-shaped thickenings at inner bases of median lobes, about twice length of lobes; a pair of thickenings between first and second lobes, as in *mimosæ*: three thickenings between second and third lobes, the middle one longest; two at interval between third and fourth lobes, the middle one being absent; one or two beyond the fourth.

Hab. On bark of branches of *Mimosa*, Verulam, Natal (Fuller, No. 9). With *Lophococcus mirabilis*. This, in its scale and other characters, is so very like the Mexican *C. mimosæ*, Comstock, that I was not perfectly sure it was distinct. I sent some to the Department of Agriculture at Washington, and Mr. Kotinsky kindly compared them with Comstock's types of *mimosæ*; he found the differences to be constant, and the species clearly distinct.

Pseudaonidia clavigera, n. sp.

♀. Scale, $2\frac{1}{2}$ mm. diam., moderately convex, blackish, entirely covered by the epidermis of the twig, except the small shining sub-lateral orange-ferruginous exuviae.

♀. No circumgenital glands, even when full of embryos. Similar to *P. tesserata*, but the median lobes are scarcely notched on the inner side; the second and third lobes are narrower (width of second lobe $8\ \mu$ in *clavigera*, 18 in *tesserata*); margin beyond fourth lobe serrate as if with many small lobes; two large round spaces below the incisions laterad of the median lobes, which, properly focussed, give the appearance (with the incisions) of the club-shaped processes of *Howardia biclavis*; anal orifice further from hind end, being 111 to $129\ \mu$ distant from the tips of the median lobes (in *tesserata* $84\ \mu$).

Hab. Durban, Natal, on twigs of camellia in the Botanic Gardens (Fuller, No. 1). The appearance of the scales, covered by the bark, and the club-shaped processes, strongly suggest the genus *Howardia*. There is also some evident affinity with *Aspidiotus moorei*, Green. The genus *Pseudaonidia* seems to be sufficiently distinct, including the following forms described under *Aspidiotus*:—*P. theæ* (Maskell); *P. theæ rhododendri* (Green); *P. duplex* (Ckll.); *P. pæoniæ* (Ckll. as var. of *duplex*); *P. trilobitiformis* (Green); *P. tesserata* (De Charmoy).

Hemichionaspis cyanogena, n. sp.

♀. Scale about or hardly 2 millim. long, slightly convex, white; narrow, with much the outline of *H. theæ*; exuviae orange, varying to pale yellowish.

♂. Scale of the usual form, not carinate.

♀. Differs from *H. minor* as follows:—Lateral margins of segments not produced; median lobes not so produced, shaped more as in *H. mussænda*, the two lobes together $27\ \mu$ broad and $12\ \mu$ long; spine-like squames more numerous, the formula (following the method

of Cooley) 1, 2 or 3, 2, 2, 2; first two rows of dorsal glands not wholly absent, but represented by one to three glands, third and fourth rows with posterior groups numbering about five. After boiling in liquor potassæ the insect exhibits a very fine blue pigment; median lobes remain yellow after boiling; genital and anal orifices opposite; outer edge of median lobes with three large crenulations; second lobe represented by two small rounded lobules, third by a rather large low lobule, or practically wanting; antennæ represented by a strong bristle on a small tubercle. Embryos in female very large, 231 μ long; eyes blue. Eggs about 300 μ .

Hab. On small branches of a plant not identified, Durban, Natal (Fuller, No. 17).

Lophococcus, n. g.

A genus of Monophlebinae Coccidæ, allied to *Monophlebus*, which becomes fixed in the adult female state, with a strongly chitinous skin, and has a large erect spine in the middle of the back, this spine originating as an elevated fold of the skin. No ovisac. Type, *L. mirabilis*.

(To be continued.)

NOTES AND OBSERVATIONS.

ON REARING *ACHERONTIA ATROPOS*.—The uncertainty of the emerging of the perfect insect from the pupa of *A. atropos* is well known, and various methods of treatment are from time to time advocated as likely to produce a satisfactory result. This uncertainty exists no doubt in a state of nature, as well as when the insect is bred in confinement, and what it is that causes or regulates it is, so far as I know, unknown. The following data may be perhaps of interest:—Early in August last (1900) I had three full-grown caterpillars brought to me from different localities in this district; all three were supplied with earth, and “went down” almost immediately. About the end of September I carefully raised the pupæ to the surface of the earth, where they remained uncovered. One very soon showed its failure by becoming mouldy, and another came out a cripple some time in October; the third remained until the 11th of this month (July, 1901), when it emerged in perfect condition, a very fine and large specimen, measuring just under five inches in the expanse of the wings. There was not at any time any application of moisture to the pupæ, nor special exposure to any higher temperature than that of the room, heated with an ordinary fireplace. I attribute the “failure” of one of the above pupæ to an evident injury received by the caterpillar before it was brought to me; the “cripple” was probably owing to there not being in the cage anything for the freshly emerged moth to climb upon (a necessity, I fancy, for the perfect expansion of the wings); this was provided for in respect to the third and successful emergence. — (Rev.) O. PICKARD-CAMBRIDGE; Bloxworth Rectory, July 16th, 1901.

BUFF-COLOURED AMPHIDASYS BETULARIA.—As the question of the buff variety of *A. betularia* has again cropped up, I may say that many years ago I experimented on dead specimens of the ordinary colour, and found that exposure to the vapour of chlorine altered them to this buff colour. At the same time I was unable to alter the forms *doubledayaria* in a similar way to the Lancashire buff varieties.—PHILIP B. MASON; Burton-on-Trent, July 3rd, 1901.

[As previously stated (*ante*, p. 180), I have two buff examples of *A. betularia*, and notice that the antennæ still remain of the normal coloration—*i. e.* entirely black in the male, and black ringed with whitish in the female. It would be interesting to know if the antennæ of other buff specimens of this species are black or buff.—R.S.]

LYCÆNA CORYDON PROTECTED BY RESEMBLANCE.—On July 17th last, near Newland's Corner, on the North Downs, a male specimen of *L. corydon* was noticed in the evening having taken up a position of rest on the flower-head of a small plantain (probably *Plantago media*). The markings of the under-surface of the wings caused the insect to be remarkably well protected by resemblance in the position it had assumed.—W. J. LUCAS; Kingston-on-Thames.

CAPTURES AND FIELD REPORTS.

ENTOMOLOGICAL NOTES FOR JUNE, 1901.—I have succeeded in rearing the larvæ of *Nemeobius lucina*, which, as I mentioned last month, emerged from ova on June 4th. At the present time they are nearly full grown, and I am wondering whether the imagines will appear this year. The first of my *Vanessa polychloros* larvæ fixed itself up to the muslin cover of the cylinder on June 10th, and the imago appeared on June 29th—*i. e.* forty-seven days from the hatching of the larva from the ovum. The rest of them came out on June 30th, but unfortunately several specimens are rather below the normal size; some, however, are very fine. I was fortunate enough to see both the process of pupating and that of the exit of the imago from the pupa-case. It was most amusing to see the pupa get rid of its old larval-skin, by butting at it till it fell down. Two of the larvæ, after having hitched up successfully, were unable to burst the skin, and consequently shrivelled up and died. They were apparently just as healthy as the rest, in fact I could detect no difference in them; but, though they struggled hard and long, they finally succumbed. The imago took exactly twelve minutes to arrive at its full size with expanded wings; and all the time the process was going on it kept curling and uncurling its proboscis, which, as far as I could see, was in two parts all the time, not joining together until the growth of the wings was complete. I have been rearing a number of larvæ of *Ennomos fuscantaria*, and their emergence from the ova was spread over three weeks; only on two occasions did more than one larva come out on the same day. The first one pupated on June 21st, and another is about to do so to-day (July 4th), but several of the larvæ are still quite small. On June 28th I got a number of *Lycæna minima (alsus)* from a disused

chalk-pit near here; they are in excellent condition, and very plentiful this year. On June 27th and several following days, when the sun has been shining, *Macroglossa stellatarum* has been observed hovering over a sweet-william flower in my garden, but I have never been near enough to take it. On June 30th a lot of *Selenia tetralunaria* came out; they are very fine specimens, and I have succeeded in pairing a couple, and in obtaining some ova for the second brood. The larvæ emerged on May 20th, and fed up very quickly, for they began to pupate on June 11th. I have also been very successful in rearing a brood of *Catocala sponsa*. When the young larvæ appeared, on April 23rd, I experienced great difficulty in finding oak leaves for them, as the trees were very backward; but I succeeded in getting some buds, which lasted till the leaves grew a little. The larvæ were full-fed on May 28th, and the imagines began to appear on July 1st, two or three having come out each morning since.

Many larvæ this year seem to be much in advance of what they were last year. For instance, my larvæ of *Smerinthus populi* are full grown now, and are going down to pupate; last year they did not emerge from ova till June 25th, and the first one pupated on July 30th. It is the same with *Sphinx ligustri*, *Smerinthus tilie*, and *S. ocellatus*, each one being from a fortnight to three weeks earlier this year. I have noticed the same thing with many of the Diurni, especially *Lycæna alsus*, *L. adonis*, *L. astrarche*, *Hesperia sylvanus*, *Vanessa urtica*, and *V. polychloros*. A friend of mine saw a specimen of *V. atalanta* yesterday, and I am told that *Colias edusa* was seen a few days ago, but cannot absolutely vouch for this statement.

I should be glad if any reader of this Journal, who happens to observe *C. edusa* or *C. hyale* within easy distance of Dorking during August, would be good enough to send me a post-card.—F. A. OLDAKER; Parsonage House, Dorking, July 4th, 1901.

CHARICLEA UMBRA (MARGINATA) AT SUGAR.—This species has occurred occasionally at sugar here during the last week or so. I have taken eight fine examples, and I believe several more have been taken by other enthusiasts at the same place. I can find no record of *C. marginata* having occurred here before.—A. J. LAURANCE; Bromley Common, Kent, July 11th, 1901.

PLUSIA MONETA AT BROMLEY, KENT.—A very fine female specimen of this species came to light at my residence on July 1st, and was fortunately captured. On July 17th I netted a specimen as it was flying over a bramble blossom within a few yards of the house. There is some *Delphinium* near by, so probably many more may be captured in the near future.—ALFRED J. LAURANCE; 8, Cross Roads, Bromley Common.

PLUSIA MONETA IN HAMPSHIRE.—A specimen of *P. moneta* has been taken here whilst hovering over flowers of *Delphinium*.—G. M. RUSSELL; Porchester, July 25th, 1901.

LYCÆNA MINIMA IN WARWICKSHIRE.—On Saturday last, June 22nd, I found *Lycæna minima* (*alsus*) in fairly large numbers at Stockton, about eight miles from here, on the banks of a chalk pit, where *Anthyllis*, its food-plant, grows in great abundance. I see that neither Newman, Morris, Kirby, nor any other authority that I have consulted

mentions this butterfly as occurring in Warwickshire.—D. T. GARRETT; School House, Rugby, June 26th, 1901.

ACRONYCTA ALNI TAKEN AT REST.—On June 8th, 1901, I took a specimen of *Acronycta alni* at rest on some nettles. I have never heard of one being taken at rest before.—R. A. McLEOD; The Myrtles, Great Malvern.

VANESSA URTICÆ ATTRACTED BY LIGHT.—On July 11th two *V. urticae* came to light through a window between 10 and 11.30 p.m.—R. A. McLEOD.

ENISTIS (GNOPHRIA) QUADRA IN DUBLIN.—To-night (July 18th) I had the pleasure of taking a female specimen of *Enistis quadra* on the pavement under one of the electric lights in this road. As I see in Barrett's 'Lepidoptera' that only one specimen appears to have been recorded from Ireland previously, I think you may consider the fact worthy of record, especially, perhaps, considering the locality, as it is scarcely an insect I should have looked for in a large town.—WILLIAM C. E. WHEELER; St. Helen's School, 23 and 25, Pembroke Road, Dublin. [For other Irish localities, see Entom. xxxiii. 331.—ED.]

OXYGASTRA CURTISII TAKEN IN HANTS.—Odonatists, if I may use the term, will be pleased to hear that the extremely scarce dragonfly, *Oxygastra curtisii*, is still with us. I have received a nice male taken by Major Robertson early in July last in its old locality in Hants. Another specimen was seen, but was not secured. The last recorded capture was in 1882, on July 11th, when Mr. Goss took four males. *O. curtisii*, once thought to be peculiar to Britain, has a limited distribution in Western Europe. It somewhat resembles *Cordulia æneus*, but may be known by the middorsal line of orange-yellow spots.—W. J. LUCAS; Kingston-on-Thames.

DEIOPEIA PULCHELLA IN THE LONDON DISTRICT.—On July 1st last, I had the pleasure of taking a specimen of *Deiopeia pulchella* on a piece of waste ground in the London district. It was unfortunately slightly damaged. I believe this a rather rare occurrence.—E. A. WARNE; 4, Spanish Road, East Hill, Wandsworth, S.W., July 7th, 1901.

[An example of this species was captured in a North London locality on June 31st, 1892: *vide* Entom. xxv. 154, 166.—ED.]

SPHINX CONVULVULI IN 1901.—Mr. H. Pestell, of Elstow, near Bedford, recently captured four specimens of *S. convolvuli* at honeysuckle. Three females were taken on June 30th, July 2nd, and 10th, and a male on July 11th. The females were slightly worn, but Mr. Pestell tells me the male is fresh, and he thinks only recently out of the pupa. It seems impossible that these specimens are from larvæ fed this year. They are therefore hibernated specimens, or from pupæ which failed to emerge last autumn. I once captured a specimen on August 11th, which was the earliest occurrence I have previously heard of.—W. GIFFORD NASH; Bedford.

On July 16th a specimen of *S. convolvuli* was brought in by a lad, who found it in his garden at Wandsworth. I took an example on West Hill, Wandsworth, August 13th, 1900.—J. MILLER; 44, Longfield Street, Wandsworth, S.W.

VARIETY OF *EUCHLORIS* (*PHORODESMA*) *PUSTULATA*.—While beating for *Geometræ* on the 3rd inst., I took, among other insects, two male *Euchloris pustulata* (an insect not uncommon here), in which the whole of the parts usually coloured green (including portions of the abdomen) were replaced by a delicate pink. The tornal blotches, &c., retain their normal position and colour, though naturally appearing less conspicuous. I may mention that there is no chemical action involved, as the insects were thus coloured while alive. Further, I always use chloroform, so there can be no question of the colouring being due to the action of cyanide or ammonia.—J. AYLWARD CHURCHILL; The Brick House, Billingshurst, Sussex.

THECLA W-ALBUM IN SHROPSHIRE.—While gathering the seeds of wych-elm here on May 28th, for larvæ of *Xanthia gilvago* and *X. ferruginea*, I found that I had taken two larvæ of *Thecla w-album*, one of which has since pupated. I believe the only previous record of this butterfly in Shropshire is that by Mr. C. G. Barrett, who found it thirty-five years ago on Benthall Edge. Having previously found and bred the larva in some abundance near Burton-on-Trent, I think I can hardly be mistaken as to its identity.—(Rev.) CHAS. THORNEWILL; Calverhall Vicarage, Whitchurch, Salop, June 6th, 1901.

SOCIETIES.

SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—June 13th, 1901.—Mr. H. S. Fremlin, F.E.S., President, in the chair.—Messrs. R. A. Adkin, Lingards Road, Lewisham, S.E.; R. Armstrong, Granville Park, Lewisham; A. W. Dodds, Stoke Newington; and W. Thornthwaite, Hersham, were elected members.—Mr. R. Adkin exhibited living larvæ of *Acidalia marginepunctata* feeding on yarrow, and pointed out that the genus *Acidalia* needed considerable revision.—Mr. Kemp, the Coleoptera *Rhagium bifasciatum*, *Donacia bicolora*, *D. sericea*, *D. semicuprea*, *D. simplex*, *D. cinerea*, and *D. discolor*; all taken at the field meeting at Byfleet on June 1st.—Dr. Chapman, the curious pupal burrow of *Scardia boleti*, showing the peculiarly constructed trap-door; and also the cocoon of *Lagoa crispata*, which shows a trap-door arrangement.—Mr. Lucas read the Report of the Field Meeting held at Oxshot on May 18th.—Mr. Adkin gave an account of the Annual Meeting of the South-Eastern Union of Scientific Societies held at Haslemere.

June 27th.—Mr. F. Noad Clark, Vice-President, in the chair.—Mr. A. W. Pepper, of Horniman's Museum, Forest Hill, was elected a member.—Mr. Ashdown exhibited specimens of *Anax imperator* and *Ischnura pumilio* taken in the New Forest, and which he afterwards placed in the Society's collection.—Mr. Turner, an almost black specimen of *Amphidasys betularia* taken in Camberwell. Several other similar examples were also reported.—Mr. West, the following Hemiptera from the river Ravensbourne:—*Microvelia pygmaea*, developed forms; *Gerris odontogaster*; *G. najas*; and *Hydrometra stagnorum*, developed and undeveloped forms.—Mr. Enock, bred specimens

of *Libellula depressa* and *L. quadrimaculata*, with var. *prænubila*: also larvæ of *Thecla betulæ*: all were collected at Epping.—Mr. Harrison, long series of *Amphidasys betularia*, including six gynandrous specimens, all bred from ova laid by a New Forest parent.—HY. J. TURNER, *Hon. Rep. Sec.*

BIRMINGHAM ENTOMOLOGICAL SOCIETY.—June 17th, 1901.—Mr. H. Willoughby Ellis, Vice-President, in the chair.—Mr. Wainwright showed a specimen of the rare Dipteron, *Brachypalpus bimaculatus*, Meq., taken at West Malvern in Whitsun week, 1901.—Mr. H. W. Ellis exhibited the following Coleoptera:—*Cychrus rostratus*, from Dovedale; *Pterostichus striola*, with its eggs, also from Dovedale; *Phytodecta rufipes* and *Apoderus coryli*, both from Knowle; and *Elater pomorum*, from Cannock; also the curiously coiled-up leaves in which are laid the eggs of *Attelabus curculionoides* and *Deporaus betulæ*.—Mr. A. D. Imms showed an immature specimen of *Phyllodromia germanica*, taken in the University Buildings, Birmingham, and said that he believed it to be the first known midland specimen.—Mr. A. H. Martineau said that he had taken male and female of the rare ant, *Myrmecina latreillii*, at Cannock Chase, the nearest place from which he had it before being Selsley, Glos.—Mr. R. C. Bradley showed *Anisopteryx æscularia*, taken in the city boundaries near Cannon Hill.—Mr. G. W. Wynn, long and nice series of *Taniocampa gracilis*, *T. instabilis*, *T. rubricosa*, all taken at sallows at Hampton-in-Arden this year; also *Cucullia chamomillæ*, from Marston Green.—COLBRAN J. WAINWRIGHT, *Hon. Sec.*

RECENT LITERATURE.

D. J. SCOURFIELD. *The Swimming Peculiarities of Daphnia and its Allies, with an Account of a New Method of examining living Entomostraca and similar Organisms.* (1900, Journ. Quekett Microsc. Club (2), vii. pp. 395-404; seven text figures.)

ALTHOUGH papers upon Crustacea do not strictly come within the scope of the 'Entomologist,' Mr. Scourfield's interesting biological contribution may be studied with advantage by workers at other groups of aquatic Arthropoda.

In addition to the morphological distinctions between the four genera into which *Daphnia* of the older authors is now divided, the author points out a fundamental difference in the swimming habits of *Daphnia* and *Ceriodaphnia*, on the one hand, and *Simocephalus* and *Scapholeberis* on the other, the two former always swimming either vertically or obliquely back uppermost, the two latter always swimming more or less obliquely back downwards, so constantly so that it is impossible to mistake a swimming *Daphnia* for a swimming *Simocephalus*, even with unaided vision. To ascertain the causes of these differences, a method—detailed at length—was devised "of suspending the animals by the top of their heads in such a way that they could use their antennæ and all other organs with perfect freedom, and yet not alter their position in the water." This proved that the direction of the

stroke of the large antennæ was as nearly as possible identical in all the specimens examined. Two accidents, however, led to an inkling of the truth. In one case a *Daphnia*, who had some sealing-wax cement (used in an unsuccessful experiment) left attached to the head, was observed to have a tendency to swim somewhat obliquely back downwards, thus imitating the normal progression of a *Simocephalus*. In the other, an air-bubble had penetrated the brood cavity of a *Simocephalus* in consequence of the latter having been left too long upon a glass slip without water. The swimming of the creature "was most curious. It struggled hard against the upward pull of the air-bubble, and by the vigorous use of its antennæ it managed to make some progress in an obliquely downward direction; but it was no longer swimming in the manner of a *Simocephalus*, but . . . with its back upwards. It also clung to the sides of the glass in an inverted position, which is just the opposite to the normal behaviour of animals of the genus. The two cases of abnormal swimming just alluded to, taken in connection with what has been already found out about the direction of the stroke, proved conclusively that the main factor in determining the positions of the animals when swimming freely must be the situation of the centre of gravity." In fact, the position of the animal is due to the net result of gravity and the direction of the stroke (of the antennæ), modified by the speed of the progress, and also by the possession of shell-spines, the most active swimmers—the clear-water forms—having the greatest development of the shell-spine (and even the possession of a head-spine); while *D. pulex* and others, which are normally comparatively sluggish, exhibit short shell-spines.

The paper is illustrated by diagrams showing the directions of the various forces.

G. W. K.

E. P. FELT. *Sixteenth Report Injurious and other Insects*. (1901, Bull. Soc. N. Y. State Mus. vol. vii. No. 36, pp. 949-1063; two coloured and thirteen plain plates (comprising twenty-three photographs), one plan, and two text figures.)

THE New York State Reports have always held a very high place among contributions to economic entomology, though under the care of Dr. Felt their general plan and detailed execution show an improvement even upon the old series. The principal feature of the Sixteenth Report is the record of experimental work with insecticides in fighting scale-insects, especially *Aspidiotus perniciosus*, Comst. This is elucidated by a large plan of an infested orchard, and twenty photographs of infested trees, &c. Two beautifully executed coloured plates illustrate accounts of the gypsy moth (*Porthetria dispar*), and the "Palmer-worm" (the caterpillar of a Gelechiid, *Ypsolophus pometellus*, Harris). The relaxation of the efforts of the Massachusetts Commonwealth towards the extermination of the gypsy moth leads to the fear that it is only a question of time before its destructive powers will be felt in New York State. One of the most remarkable photographs is plate 16, showing forest-tent caterpillars (*Clisiocampa disstria*) clustered on a tree-trunk.

G. W. K.

D. J. SCOURFIELD. *The Logarithmic Plotting of certain Biological Data.* (1897, Journ. Quekett Microsc. Club, pp. 419-23, pl. xx.)

THE author advocates the use of logarithmically ruled sectional paper for the graphic representation of certain biological data. This paper is produced by "first of all drawing a series of lines at *equal* distances apart, according to any convenient scale, representing, say, the series of numbers 1, 10, 100, 1000, 10000, &c., the logarithms of which are 0, 1, 2, 3, 4, &c., respectively, and then dividing the spaces so obtained *unequally* by lines drawn at distances equal to .3010, .4771, .6021, .6990, .7781, &c., which are the logarithms of the numbers 2, 3, 4, 5, 6, &c." It is not possible to give an adequate idea of the method of procedure without reprinting the whole of the tersely written paper, but attention is drawn to it as likely to be of some use to those entomologists who are investigating exhaustively such phenomena as variation, &c.

G. W. K.

Economic.—E. P. FELT. *Illustrated Descriptive Catalogue of some of the more important Injurious and Beneficial Insects of New York State.* (1900, Bull. Soc. N. Y. State Mus. viii. No. 37, pp. 1-52, eighty-three text figures.)

E. E. GREEN discusses "Some Caterpillar Pests of the Tea-Plant" (September, 1900, Circular, Botan. Gardens, Ceylon (1), 19, pp. 239-65). Eleven species are described, and remedial measures discussed. The importance of being beforehand with the caterpillars, and of stamping out the earlier broods before they have time to breed and extend their area of operation, is emphasized.

Lepidoptera.—N. KUSNEZOV describes the protective coloration of the wings of the Crimean *Libythea celtis*, and figures its attitude in repose, which exactly resembles a dead leaf, the antennæ and palpi being made use of in the simulation (the butterfly being unique in this respect). (Horæ Entom. 1900, xxxv.; summary and figure in 'Psyche,' 1901, pp. 184-5.)

Neuroptera.—G. A. POUJADE notes a female French Odonate (*Coridulegaster annulatus*, Latr.), in which the left antenna is composed of three unequal bristles, articulated on a single large and deformed scape, while the right antenna is normal (1899, Bull. Soc. Ent. France, pp. 44-5, two figures).

Orthoptera.—M. V. SLINGERLAND records the discovery for the first time in America of a European beneficial insect, *Mantis religiosa* (1900, Entom. News, p. 18; see also *l. c.* 1899, pp. 288-9, under the name of *Stagmomantis carolina*).

CHR. AURIVILLIUS describes forty-two species of Swedish Orthoptera, of which about twenty-eight also occur in the British Isles ("Svensk Insektfauna 2 Orthoptera" in Ent. Tidskrift, 1900, xxi. pp. 233-54, fourteen text figures).

G. W. K.

OBITUARY : ELEANOR A. ORMEROD, LL.D.

WE regret to have to chronicle the death of this gifted lady, who has spent the greater part of her life on the study and practical application of entomology.

Her father was George Ormerod, D.C.L., F.R.S., author of the 'History of Cheshire,' who came of an old Lancashire family, the Ormerods of Ormerod. She was a student of natural history from quite early age, and as her father advanced in years she took an active part in the management of his farm and property, Sedbury Park, Gloucestershire, beautifully situated, opposite to Chepstow. This gave her practical knowledge of agriculture; and here was the seed plot from which so much good fruit was to ripen.

Dr. Robert Wallace, Professor of Agriculture in the University of Edinburgh, writes to us:—"The name of Miss Eleanor A. Ormerod is widely known among all classes of the community, and the excellent quality of her work is recognised and appreciated by those who are specially interested in the scientific aspect of it. But the magnitude and true value of her gratuitous labours from the practical point of view of the farmer are probably not sufficiently understood by the general public. Twenty-four voluminous Annual Reports have appeared; and the following standard works have been issued from time to time:—'A Manual of Injurious Insects, with Methods of Prevention and Remedy' (two editions); 'Handbook on Insects Injurious to Orchard and Bush Fruits'; 'Observations on Injurious Insects of South Africa'; a 'Guide to Methods of Insect Life'; and a 'Text-Book of Agricultural Entomology,' &c. Free gift copies of the Annual Report were sent to all correspondents who supplied any of the information adopted. Besides what may be termed substantial publications, many four-page leaflets on the common farm pests were prepared with, in each case, an illustration of the creature described, and gratuitously circulated to meet a rapidly growing demand for guidance among farmers and stockowners. Among these were issued accounts of the widely destructive wireworm and equally destructive grub of the crane fly, or daddy longlegs; the mangel-leaf maggot; the mustard beetle; the minute stem eelworm (invisible to the naked eye), which produces 'Tulip-root' in grain crops, and is largely responsible for the condition known as 'clover sickness'; the troublesome forest fly, which her recent investigations showed to be present in two other districts besides that of the New Forest in Hampshire; and the 'Warble Fly, its history and easily practicable methods of prevention and remedy.' Of the last-named leaflet, 155,000 copies were circulated at her own expense. From letters in my possession, as the editor of Miss Ormerod's Reminiscences, it is clearly shown that by her numerous distinguished foreign correspondents she was universally acknowledged to be the greatest authority on economic

entomology that this country has possessed in recent years, and one of the inner circle of the highest authorities in the world."

Only last year the University of Edinburgh conferred on her the LL.D., the highest honorary distinction of merit within its power. This was the first time a lady had received such an honour in the Scottish capital. Sir Ludovic Grant, the Secretary to the Senatus, in presenting Miss Ormerod to the Vice-Chancellor, said:—

"A duty now devolves upon you, Sir, which has devolved upon none of your predecessors, and of which the performance will render the present occasion memorable in the annals of the University. Our roll of Hon. Graduates in Law contains the names of many illustrious men, but you will search it in vain for the name of a woman. To-day, however, a new roll is to be opened—a roll of illustrious women; and it is matter for congratulation that this roll should begin with a name so honoured as that of Miss Ormerod. The pre-eminent position which Miss Ormerod holds in the world of science is the reward of patient study and unwearying observation. Her investigations have been chiefly directed towards the discovery of methods for the prevention of the ravages of those insects which are injurious to orchard, field, and forest. Her labours have been crowned with such success that she is entitled to be hailed as the protectress of agriculture and the fruits of the earth—a beneficent Demeter of the nineteenth century. It would take long to enumerate her contributions to Entomological and Phenological literature, but I may select for mention the valuable series of Reports extending over twenty years, the preparation of which involves correspondence with all parts of the world. Remarkable too is the list of the honours which she has received. She was the first lady to be admitted a Fellow of the Royal Meteorological Society, and she has been awarded the Silver Medal of the 'Société Nationale d'Acclimatation' of France. To these distinctions the University of Edinburgh, sensible of her conspicuous services, and not unmindful of her generous benefactions, now adds its Doctorate in Laws."

The Annual Report of Injurious Insects published this year contains a note of farewell. She had lived to see her work finished. The histories of our worst insect pests had been gradually completed. It was only by almost heroic energy and determination that she had replied, in full and courteous manner, to constant inquiry; and now the time had come for a mere reference to published information. She had been collecting reminiscences of her early life; retirement would give opportunity for preparing these for publication, and this became for a few months her chief interest. Then came serious illness, and, though the mind remained strong and clear, the bodily powers had failed. Death took place on the 19th July; she was seventy-three years old. So passed away a life of altruism, whose loss will be mourned both far and near.—T. P. N.

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THE NEW EDITION OF "STAUDINGER'S CATALOGUE."*

SINCE the second edition of this valuable Catalogue of Lepidoptera was published, now some thirty years ago, quite a number of changes in nomenclature, and some new arrangements of families and genera have been proposed, and to some extent accepted by lepidopterists.

In the most recent systems of classification the sequence of families is regulated by their supposed relationship, and it follows that authors, when investigating different sets of facts, may very justly arrive at quite opposite phylogenetic conclusions, and, as a consequence, their systems may be antagonistic. The structural characters of the perfect moth or butterfly afford excellent material for the purpose of the systematist, but it must be admitted that such material is not all-sufficient, and often leaves the true position of certain units in a scheme doubtful. Our knowledge of the earlier stages of Lepidoptera is ever increasing, and the work effected by specialists in this field of investigation is most valuable, as it serves to modify or disprove some of the conclusions arrived at by those who depend on imaginal characters alone. Very much more work on ova, larvæ, and pupæ of Lepidoptera will, however, have to be done, before a classification based on the earlier stages can rank as high as one drawn from a study of the imagines. Classification, then, being in a state of transition, it is evident that no very considerable disturbance of the old order of arrangement in our Catalogues is desirable or expedient. If the most natural sequence of families, &c., at present possible is still only of a tentative character—and it is presumed that absolute finality is not claimed for any of the later systems—the middle course adopted in the work under notice is in every way the best. No one having a knowledge of the complex nature of the subject would suppose that a faultless scheme could be evolved from the facts at present available.

It may safely be said that lepidopterists generally will feel grateful that the aim has been to place the third edition of the 'Catalog' in

* *Catalog der Lepidopteren des Palearctischen Faunengebietes.* Von Dr. Phil. O. STAUDINGER und Dr. Phil. H. REBEL. Dritte Auflage des Cataloges der Lepidopteren des Europäischen Faunengebietes. Berlin: R. Friedländer & Sohn. * May, 1901.

line with modern requirements, without introducing any very revolutionary changes, either in the arrangement of families and genera, or of the names of species.

The old terms of "Macro-lepidoptera" and "Micro-lepidoptera" are discarded, but the 'Catalog' is still arranged in two parts as before. Theil I., for which the late Dr. Staudinger was mainly responsible, contains the species previously referred to as Macro-lepidoptera, and these are distributed among thirty-nine families, five of which are divided into subfamilies. The families are placed in the following order:—

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|--------------------|-------------------|------------------|
| 1. Papilionidæ | 16. Brahmæidæ | (d) Orthostixinæ |
| 2. Pieridæ | 17. Bombycidæ | (e) Boarmiinæ |
| 3. Nymphalidæ | 18. Drepanidæ | 26. Uraniidæ |
| (a) Nymphalinæ | 19. Callidulidæ | 27. Epiplemidæ |
| (b) Danainæ | 20. Thyrididæ | 28. Nolidæ |
| (c) Satyrinæ | 21. Noctuidæ | 29. Cymbidæ |
| 4. Libytheidæ | (a) Acronyctinæ | 30. Syntomidæ |
| 5. Erycinidæ | (b) Trifinæ | 31. Arctiidæ |
| 6. Lycænidæ | (c) Gonopterinae | (a) Arctiinæ |
| 7. Hesperiidæ | (d) Quadrifinæ | (b) Lithosiinæ |
| 8. Sphingidæ | (e) Hypeninæ | 32. Heterogynidæ |
| 9. Notodontidæ | 22. Agaristidæ | 33. Zygænidæ |
| 10. Thaumetopoeidæ | 23. Cymatophoridæ | 34. Megalopygidæ |
| 11. Lymantriidæ | 24. Brephidæ | 35. Cochlidiidæ |
| 12. Lasiocampidæ | 25. Geometridæ | 36. Psychidæ |
| 13. Endromiidæ | (a) Geometrinæ | 37. Sesiidæ |
| 14. Lemoniidæ | (b) Acidaliinæ | 38. Cossidæ |
| 15. Saturniidæ | (c) Larentiinæ | 39. Hepialidæ. |

Theil II., by Dr. Rebel, comprises the "Micro-lepidoptera," and the families, eighteen in number, are as under:—

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|--------------------|---------------------|---------------------|
| 1. Pyralidæ | (a) Choreuthinæ | 11. Gracilariidæ |
| (a) Galleriinæ | (b) Glyphipteryginæ | (a) Gracilariinæ |
| (b) Crambinæ | (c) Douglasiinæ | (b) Lithocolletinæ |
| (c) Schoenobiinæ | 6. Yponomeutidæ | 12. Lyonetiidæ |
| (d) Anerastiinæ | (a) Yponomeutinæ | (a) Lyonetiinæ |
| (e) Phycitinæ | (b) Argyresthiinæ | (b) Phyllocnistinæ |
| (f) Epipaschiinæ | 7. Plutellidæ | 13. Nepticulidæ |
| (g) Chrysauginæ | (a) Plutellinæ | 14. Talæporiidæ |
| (h) Endotrichinæ | (b) Orthotælinæ | 15. Tineidæ |
| (i) Pyralinæ | 8. Gelechiidæ | (a) Atychiinæ [iinæ |
| (k) Hydrocampinæ | (a) Gelechiinæ | (b) Ochsenheimer- |
| (l) Scopariinæ | (b) Blastobasinæ | (c) Acrolepiinæ |
| (m) Pyraustinæ | (c) Cœcophorinæ | (d) Setomorphinæ |
| 2. Pterophoridæ | 9. Tinægeriidæ | (e) Lypusinæ |
| 3. Orneodidæ | 10. Elachistidæ | (f) Teichobiinæ |
| 4. Tortricidæ | (a) Scythridinæ | (g) Tineinæ |
| (a) Tortricinæ | (b) Momphinæ | (h) Adelinæ |
| (b) Conchylinæ | (c) Heliozelinæ | 16. Crinopterygidæ |
| (c) Olethreutinæ | (d) Coleophorinæ | 17. Eriocraniidæ |
| 5. Glyphipterygidæ | (e) Elachistinæ | 18. Micropterygidæ |

The number of species enumerated in Theil I. is 4744, which, with 13 given in the Addenda, make a total of 4757 as against 2854 in the second edition. In Theil II. there are 4962 species, including 180 in the Addenda, thus exceeding the total in the corresponding part of the 1871 'Catalog' by 1735.

These very considerable additions are largely due to the extended eastern and southern limits of the region embraced under the term Palæarctic. Formerly Dr. Staudinger drew the eastern line at the Amur, but now Ussuri is included, and in many cases Northern China, Corea, and Japan also.

The changes adopted in genera and in specific names, so far as concerns British species, will be found in the list at the end of these remarks. It may, however, be mentioned here, that the somewhat unwieldy genera—*Agrotis*, *Cidaria* (changed to *Larentia*), and *Acidalia* are still retained, and not even sectionized as formerly, although a very much larger number of species are referred to each of them. In *Agrotis*, for example, there are now 304 species, whilst in the second edition there were only 171. In the matter of genera there probably will never be a time when perfect unanimity will prevail. We shall always have "splitters" and "lumpers"; the former will continue to found new genera, or to drag forth the dead ones; and the latter will re-inter many of the defunct, and deal summarily with the newly created. These differences of opinion among the doctors are apt to confuse and perplex the student, but they make for progress in the end.

A retrogressive step seems to be that many names which appeared in the synonymy in the second edition have been dropped out without in any way being accounted for, so that workers will still have to refer to the second edition, as well as to the third, to obtain full synonymy.

We have little doubt that this new edition will be as generally accepted and as widely adopted as was that which it now supersedes. The 1871 'Catalog' was of the utmost service to the student of the lepidopterous fauna of Europe, but the revised and extended edition will be simply indispensable to those who are interested in Palæarctic Lepidoptera.

The more important changes in nomenclature among British species of "Macro-Lepidoptera" are for the most part concerning genera, and are as given below:—

Leptidia sinapis for *Leucophasia sinapis*.

Polygonia c-album for *Vanessa c-album*.

Epinephele ianira, L., changed to *E. jurtina*, L.

Aphantopus hyperanthus for *Epinephele hyperanthus*.

Callophrys rubi for *Thecla rubi*.

Zephyrus quercus and *Z. betulæ* for *Thecla quercus* and *T. betulæ*.

Chrysophanus dispar and *C. phleas* for *Polyommatus dispar* and *P. phleas*.

Lampides bœticus for *Lycæna bœtica*.

Lycæna argus, Linn., for *L. ægon*, Schiff.

Cyaniris argiolus for *L. argiolus*.

Pamphila palæmon for *Carterocephalus palæmon*.

Hesperia lineola, *A. thaumas*, and *A. actæon* in *Adopæa*.

- Hesperia comma* and *A. sylvanus* in *Augiades*.
Hesperia malvæ for *Syrichthus malvæ*.
Thanaos tages for *Nisoniades tages*.
Dilina tilia for *Smerinthus tilia*.
Daphnis nerii for *Deilephila nerii*.
Protoparce convolvuli for *Sphinx convolvuli*.
Hyloicus pinastri for *Sphinx pinastri*.
Deilephila celerio and *D. elpenor* in *Chærocampa*.
Metopsilus porcellus for *Deilephila porcellus*.
Hemaris fuciformis, L., for *Macroglossa fuciformis*, L. [= *bombyli-formis*, O].
Hemaris scabiosæ for *Macroglossa bombyliiformis*, Esp. [= *fuciformis*, O].
Harpyia bicuspis, *H. furcula*, and *H. bifida* in *Cerura*.
Dicranura vinula for *Harpyia vinula*.
Notodonta tremula (*dictæa*) and *N. dictæoides* in *Pheosia*.
Leucodonta bicoloria for *N. bicoloria*.
Euproctis chrysorrhæa for *Porthesia chrysorrhæa*.
Stilpnolia salicis for *Leucoma salicis*.
Lymantria dispar for *Ocneria dispar*.
Lymantria monacha for *Psilura monacha*.
Bombyx neustria and *B. castrensis* in *Malacosoma*.
Bombyx lanestris in *Eriogaster*.
Bombyx quercus and *B. trifolii* in *Lasiocampa*.
Bombyx rubi in *Macrothylacia*.
Cosmotriche potatoria for *Lasiocampa potatoria*.
Epicnaptera ilicifolia for *Lasiocampa ilicifolia*.
Gastropacha quercifolia for *Lasiocampa quercifolia*.
Craniophora ligustri for *Acronyeta ligustri*.
Neuronia popularis and *N. cespitis* in *Epineuronia*.
Dianthæcia luteago var. *argillacea*, Hübn., for *D. luteago* var. *barrettii*, Dbld.
Luperina haworthii and *L. matura* in *Celæna*.
Hadena exulus, Lef. = *diffusa*, Hb., a form of *H. maillardi*, H.-G.
Hadena secalis, Bjerk., for *H. didyna*, Esp. (= *oculea*, Gn.).
Asteroscopus nebulosa and *A. sphinx* in *Brachionycta*.
Nonagria brevilinea for *Leucania brevilinea*.
Petilampa arcuosa for *Caradrina* (*Hydrilla*) *arcuosa*.
Panolis griseovariegata, Goeze, for *P. piniperda*, Panz.
Pyrrhia umbra for *Chariclea umbra*.
Emmelia trabealis for *Agrophila trabealis*.
Laspeyria flexula for *Aventia flexula*.
Habrosyne derasa for *Gonophora derasa*.
Asphalia diluta, *A. flavicornis*, and *A. ridens* in *Polyplocæ*.
Phorodesma pustulata and *P. smaragdaria* in *Euchloris*.
Thalera lactearia for *Iodis lactearia*.
Hemithea strigata for *Nemoria strigata*.
Ephyra, Dup., for *Zonosoma*, Ld.
Larentia, Tr., for *Cidaria*, Tr.
Asthena for *Cidaria candidata*.
Eupithecia coronata, *E. rectangulata*, and *E. debiliata* in *Chloroclystis*; all other *Eupitheciæ* in *Tephroclystia*.
Cidaria polygrammata, *C. lapidata*, *C. vitalbata*, and *C. tersata* in *Phibalapteryx*.

Cabera pusaria and *C. exanthemaria* in *Deilinia*.
Ennomos, Tr., for *Eugonia*, Hübn.
Hygrochroa syringaria for *Pericallia syringaria*.
Gonodontis bidentata for *Odontopera bidentata*.
Opisthograptis luteolata for *Rumia luteolata*.
Semiothisa, Hübn., for *Macaria*, Curt.
Halia wauaria and *H. brunneata* in *Thamnonoma*.
Scodion fagaria, Thnbg., for *S. belgaria*, Hb.
Perconia strigillaria for *Aspilates strigillaria*.
Sarrothripus revayana for. *S. undulana*.
Phragmatobia fuliginosa for *Spilosoma fuliginosa*.
Parasemia plantaginis for *Nemeophila plantaginis*.
Diacrisia sanio for *Nemeophila russula*.
Callimorpha quadripunctaria, Poda., for *C. hera*, Linn.
Emydia striata and *E. cribrum* in *Coscinia*.
Hipocrita jacobææ for *Euchelia jacobææ*.
Mitochrista miniata for *Calligenia miniata*.
Endrosa irrorella for *Setina irrorella*.
Cybosia mesomella for *Setina mesomella*.
Comacla senex for *Nudaria senex*.
Ænestis quadra for *Gnophria quadra*.
Pelosia muscerda for *Lithosia muscerda*.
Zygæna purpuralis, Brünnich, for *Z. pilosellæ*, Esp.
Z. filipendulæ var. *hippocrepidis*, Steph., renamed *tutti*, Rbl.

PSYCHIDÆ.

Pachytelia villosella for *Psyche villosella*.
Sterrhopterix hirsutella for *Psyche hirsutella*.
Fumea casta, Pall., for *F. intermediella*, Brd.
Bacotia sepium for *Fumea sepium*.

HEPIALIDÆ.

Hepialus fusconebulosa, De Geer, for *H. velleda*, Hb.

ON THE BRITISH AND FINNISH SPECIES OF THE
 ORTHOPTEROUS GENUS *ACRYDIUM*, GEOFFROY, KIRBY
 (= *TETRIX*, LATR.).

BY G. W. KIRKALDY, F.E.S.

IN Finland there are four species of *Acrydium* (= *Tetrix* = *Tettix*), of which two are British. As one very probably, and one possibly, of the other two may occur in Britain, and as the genus has been treated comparatively briefly in the latest notices,* a résumé of a paper on the Finnish species by J. SAHLBERG* may be of interest to British entomologists.

The larvæ, beyond their softer texture, have all their appen-

* J. SAHLBERG, 1893, "Om de finska arterna af orthopterslägtet *Tettix*, Charp.," in 'Ofverstryck ur Sällsk. pro Fauna Fennica Medd.' pp. 43-8; M. BURR, 1897, 'British Orthoptera,' pp. 46-7; BURR, 1898, Entom. p. 127; W. J. LUCAS, 1901, Entom. p. 166, pl. iii.

dages shorter, even of the pronotum, which has a more elevated dorsal keel. The pronotum latero-posteriorly is simply curved, and the keel on the posterior femora is uninterrupted up to the apex.

The *imago* is of firmer texture, has longer appendages, and longer but less elevated pronotum. The latter is bisinuate latero-posteriorly; within the upper of the curves are seen the rudimentary tegmina. The keel on the posterior femora is interrupted before the apex. In the short-winged forms the wings do not reach to the tip of the pronotal extension, although the latter does not extend beyond the apex of the posterior femora. In the long-winged forms the wings reach beyond the pronotal extension, although the latter stretches out far beyond apex of posterior femora.

TABLE OF THE SPECIES.

1. 4. Dorsum of prothorax slightly tectiform, median carina less elevated, somewhat straight in front as seen in profile. Head in front (in profile) angulate, frontal line forming an angle with the vertex.
2. 3. Head apically more acutely produced, frontal line forming a somewhat acute angle with the vertex, distinctly sinuate at the insertion of the antennæ. Intermediate femora with keels slightly undulate, keel of posterior femora (as seen from above) angulate. Posterior metatarsi with small pulvilli, straight beneath, third almost longer than the two preceding together, first distinctly shorter than the second . . . *A. fuliginosum*, Zett.
- Var. *α*. Brownish black, antennæ widely flavous at the base, lateral spots on the pronotum triangular, more or less distinct, blackish holosericeous . . . (*fuliginosum*, Zett.)
- Var. *β*. Brownish black, antennæ as in var. *α*; posterior femora with a large transverse rufo-testaceous spot in the middle of the exterior margins . . . (*fascipes*, Zett.)
- Var. *γ*. Brownish black, antennæ (apex excepted), a broad continuous median stripe on the pronotum, and a line on each side above the base of the wings, yellow; annulations of the anterior tibiæ and three large spots on the posterior femora externally, whitish. On each side of the pronotum there are three large, lateral, blackish holosericeous spots, of which the first, sub-apical, is triangular; the second is larger and trapezoidal, the third posteriorly narrow, sublunate
(*pulchella* (Sahlb.))
3. 2. Head less produced apically, frontal line straight, forming a right angle with the vertex. Keels of intermediate femora not undulate, posterior keel (seen from above) not angulate. Posterior metatarsus with pulvilli less depressed, beneath obliquely subrotundate-angulate, third shorter than two preceding together
A. subulatus (L.)

- a*, Posterior extension of prothorax extending considerably beyond apex of femora. Wings a little longer than prothorax *Forma macroptera* (= *A. subulatus* (Auct.))
- β*. Posterior extension not or scarcely extending beyond apex of femora. Wings little explicate, a little shorter than prothorax.

Forma brachyptera (= subsp. *A. sahlbergi* (Saulcy))

4. 1. Dorsum of prothorax distinctly tectiform, median keel considerably elevated, and anteriorly (seen in profile) roundly-declivous. Head apically somewhat obtuse, frontal line roundly continued on the vertex. Species generally short-winged.
5. 6. Antennæ slender, fourth and fifth segments equal in breadth, four times as long as the middle segments, three times as long as penultimate and middle keel of vertex, in the middle of the apex, reaching a little beyond the lateral keels. Anterior margin of pronotum fairly straight. Posterior metatarsus with obliquely angulate pulvilli. Dorsal spots transversely sublunate-triangular *A. tenuicornis* (J. Sahlb.)
6. 5. Antennæ somewhat incrassate, fourth and fifth segments strongly, sixth distinctly transverse, penultimate twice longer than wide. Head as in *tenuicornis*. Pronotum with anterior margin distinctly angulate. Posterior metatarsus with insignificant pulvilli, beneath straight. Dorsal spots generally distinctly rhomboidal, anteriorly obliquely placed *A. bipunctatus* (L.)
- a*. Prothoracic extension extending far beyond apex of femora. Wings explicate, distinctly longer than prothorax. *Forma macroptera*.
- β*. Prothoracic extension reaching apex of posterior femora. Wings not explicate, much shorter than prothoracic process *Forma brachyptera* (*A. bipunctatus* (Auct.))

It will be seen from the above that the characters relied upon by British workers for the specific differentiation of *subulatus* and *bipunctatus* refer apparently only to the brachypterous form of the former, and to the macropterous form of the latter. It is to be hoped that this genus will be actively searched for and examined, as it is quite possible that all the forms described above may occur with us.

I have followed Kirby in the use of the name *ACRYDIUM* (Geoffr. 1762), which has undoubted right of priority over *Tetrix*, Latr. 1802 (usually written—as, indeed, by Sahlberg, Burr, and Lucas—*Tettix*).

NOTES ON LEPIDOPTERA FROM THE MEDITERRANEAN.

BY T. B. FLETCHER, R.N., F.E.S.

(Continued from p. 223.)

At Malta, during May, I had few opportunities for collecting, but came across the following species :—

Pyrameis cardui. Common.

Cænonympha pamphilus. Common, but worn.

Polyommatus astrarche and *P. icarus*. Common.

Pieris rapæ. Abundant; some of the females strongly suffused with black.—*P. brassicæ*. Common; a new brood.

Pontia daphidice. Moderately common.

Macroglossa stellatarum. Abundant.

Deilephila livornica and *D. euphorbiæ*. One specimen of each.

Heliothis armigera. One.

Erotyla trabealis (sulphuralis). One.

Anaitis plagiata. Fairly common.

Adela sp. One.

On the 22nd May we were suddenly hurried off on account of the mail troubles in Turkey, and arrived at Syra on the 24th. At this time of year the island was very bare and parched up, the only greenery apparently being in the orchards. I landed on the 25th, but a few *Thalpochares ostrina* *Pyrameis cardui*, and *Epinephele ianira* seemed to represent all the Lepidoptera on the wing.

The mail difficulties being settled, we left Syra on the 1st June, and, after looking in at Phalerum, found ourselves at Suda Bay, Crete, on June 2nd. The next afternoon I went in search of *Cænonympha thyrsis*, which is peculiar to Crete. A thunderstorm was brewing round the hill-tops, and the moist air was laden with the scent of the myrtle, wild thyme, sage, peppermint, &c., with which the hills were clothed; the butterflies were rather sluggish on the wing in consequence, and required to be knocked out of the bushes, from out of which also the big green lizards came rustling in a great state of mind. The following were the Lepidoptera met with :—

Danais chrysippus.—A specimen was flying round the ship in the morning, but I saw none ashore.

Hipparchia semele var. *aristæus*.—Common.

Epinephele ianira var. *hispulla*.—Abundant.

Cænonympha thyrsis.—Very common everywhere. Flits about over the bushes and herbage, keeping close to the ground; its habits seem precisely similar to those of our little *C. pamphilus*, which it seems to quite replace here.

Pararge egeria and *Satyrus megæra*.—Common round a small group of plane- and fig-trees; the *egeria* were of course the South European form.

Lampides bœticus.—One tattered specimen.

Cyaniris argioides.—A few males round the plane-trees.

Polyommatus icarus.—Males abundant, females not very common. There is one ab. *icarinus* amongst my captures, but several vary in the opposite direction, *i. e.* are increscent forms.

Spilothyrus alceæ var. *australis*.—Fairly common, especially in hollows at the foot of the hills.

Adopæa actæon.—Common. In the evening, when waiting in the dockyard for the boat, I took a nice little series settled on clumps of rushes.

Dysauxes punctata.—One specimen, inclining to subsp. *hyalina*, Freyer.

Ophiura bifasciata (*geometrica*).—One.

Thalpocharis ostrina.—I only noticed one, but it was probably common.

Besides these there are several undetermined Geometrids and Pyralids, and a Sphingid which was hovering over flowers in the afternoon; from a glimpse I got of this last, I put it down as *Hippotion celerio*. Curiously enough, the ubiquitous *P. cardui* and *M. stellatarum* did not put in an appearance. Lepidoptera were by no means the only insects about, and a hymenopterist especially would have been in clover. One of the most striking insects observed was *Palpares libelluloides* (a Myrmeleonid); it has a wild, weak, flapping flight, but is wary when settled, and difficult to approach.

We left Suda Bay very early on June 3rd, and got to Malta next morning, coaled, and joined the Fleet the day after off the north coast of Sicily. On June 9th a specimen of *Manduca* (*Acherontia*) *atropos* was caught on board, and brought to me. Weighing all the probabilities, it appears to me that it flew on board the night before, during which we were not less than seventy miles from land; but, especially in these days of short passages, it is extremely difficult to assert positively that an insect has actually flown on board from any distance over the water, and has not previously come on board the ship—or another ship of the Fleet—on a previous occasion when in harbour; even when actually *seen* flying inboard apparently from the open sea, there is a possibility that it may have been on board before, and only be returning from a flight outboard in search of another place of refuge. In the case of birds which have flown on board, I have often seen them take a long flight outboard in search of land, and then return again to the ship as their only refuge; if not before noticed on board, we might readily credit this return to the ship as a first arrival. However, in the present case, *M. atropos* has well-known powers of flight.

(To be continued.)

FURTHER NOTES ON FORCING *AGROTIS ASHWORTHII*.

By COLONEL PARTRIDGE.

THOUGH I have mainly to record a failure, the following notes may prove interesting:—

On March 26th last I received twenty half-grown larvæ, which were placed in a moderately warm greenhouse, and fed on hawthorn buds and leaves, which were then just obtainable. On April 10th they commenced to go down, and by the 16th all had disappeared. On the 19th the first imago appeared, and by the 24th nine had emerged, which a subsequent examination of the pot showed were all that had pupated.

On the 23rd I placed a male and female together, but, though very closely watched, I could not see that they paired; so, to make matters more sure, the next night I placed a fresh male in the cage. During the night of the 26th, 200 ova were deposited, the second night 103, the third night 35, the fourth night none, but on the fifth night a further 142, making a total of 480. Forty-eight hours after being deposited the ova turned light brown, with the exception of one egg, and this egg was the only one which failed to produce a larva. The larvæ were given knot-grass, to which they readily took, and were fed on it throughout, and thrived amazingly, with the exception of the 142 larvæ from the last-laid ova, which died almost immediately, apparently for the most part too weakly to make their first meal off the egg-shell. Losses occurred from time to time, but I believe in every instance the result of accident, being overlooked in changing the food, or escape from the pots; in no single instance did I find a dead body until the final catastrophe came. The larvæ had been kept throughout in large flower-pots piled against the hot-water pipes in the bath-room, and commenced to pupate on July 16th. About this time the great heat-wave set in, but a day or two's absence from home prevented my moving them to cooler and more roomy quarters, and in four days I lost the lot, with the exception of seven, which had already pupated, and which are now producing imagines. The disease which killed them seemed to be a fungoid growth which appeared on the anal segment in the shape of a small yellow spot, much like the commencement of a gathering. The anal segment then assumed a wrinkled look, as if the larva had cast its skin, and it remained sticking there. After this death was only a matter of an hour or two, when the larva was black, drawn out, and flaccid.

The main points of interest appear to me to be—1st. The wonderful fecundity of this species. 2nd. That by breeding from parents, themselves forced, I was able to obtain a second

brood two months earlier than Mr. Tait succeeded in doing from "wild" ova.

The time taken from egg to imago was exactly nine weeks, as Mr. Tait states in his notes.

72, St. John's Park, Blackheath : Aug. 5th, 1901.

DESCRIPTION OF A NEW SPECIES OF CICADIDÆ FROM THE ISLAND OF HAINAN.

BY W. L. DISTANT.

Cosmopsaltria hainanensis, sp. n.

Head, pronotum, and tympana olivaceous; abdomen pale brownish. Head with a central spot at apex of front and the anterior angles of the vertex ochraceous; area of the ocelli pale castaneous, and with a small piceous spot at its base. Pronotum with a central pale longitudinal fascia, margined with pale castaneous; extreme posterior margin piceous, and two brown spots near each outer edge of the posterior marginal area. Mesonotum with two obscure obconical spots at anterior margin, outwardly and narrowly margined with black; an obscure marginal fascia on each side, and two central spots at base pale castaneous; cruciform elevation ochraceous, with a piceous spot near each anterior angle. Abdomen above ochraceously pilose, and with the posterior segmental margins ochraceous. Body beneath, legs, and opercula pale olivaceous; the anterior and intermediate tibiæ and tarsi piceous. Tegmina and wings pale hyaline, the venation ochraceous; tegmina with the costal membrane ochraceous with a central black line. Opercula reaching the apex of the abdomen, concave, and margined with black on each side near base, then convexly widened, their apices obtusely rounded. Long. excl. tegm. ♂ 43 millim. Exp. tegm. 106 millim.

Hab. Hainan—Five Finger Mountain (Whitehead, Brit. Mus.).

Allied to *C. feæ*, Dist., from which it principally differs by the longer opercula.

Since this description was written my own collection contains a second example, presented to me by Dr. Heath with some other insects from Hainan Island.

SOUTH AFRICAN COCCIDÆ.

BY T. D. A. COCKERELL.

(Concluded from p. 227.)

Lophococcus mirabilis, n. sp.

♀. Adult very convex, 10 millim. long, 8 broad, and 7 high, exclusive of the dorsal spine; very strongly chitinated throughout, hard, tough but brittle, blackish brown, rugose and dull, with a thin coating of granular wax; on the middle of the back is a stout erect spine about 3 millim. long, like a spike on a military helmet; on each side is a pair of short stout spines in the subdorsal region, the posterior smaller and not amounting to more than a nodule; anterior end of insect somewhat elevated, with two more or less developed blunt and thick longitudinal keels; margin nodular; on the under surface the thoracic region is firmly attached to the bark, so that when the insect is taken off a piece of bark comes with it. Anal orifice large and very little posterior to the middle of the insect, as in *Crypticerya*.

Younger ♀. 8 millim. long, and not over 3 high (excluding spine); the protuberances of the adult all well-developed, the spine about as large; there is also a protuberance just in front of the spine; the anterior keels converge to a nodule in the middle line, forming a reversed V; and there are blunt lateral keels including the subdorsal protuberances, crenulate posterior to them. Margin with about fourteen tooth-like dull white protuberances on each side, these being really lamellæ of dense wax; from about the bases of these lamellæ come some very fine silvery threads.

Still younger forms have the dorsal spine arising as a transverse fold. The cast skins of the young forms are snow-white, much as in *Icerya*, with a fringe of waxy lamellæ. The legs and antennæ of the young are large and ferruginous.

The legs and antennæ seem to come to their full development in individuals little over 5 millim. long.

Antennæ 10-jointed, the joints after the third greatly bulging on one side, the sutures therefore very deep; last joint long and falciform. Measurement in μ :—(1) ?, (2) 90, (3) 90, (4) 60, (5) 60, (6) 70, (7) 70, (8) 75, (9) 75, (10) 216 to 294. Joints 2 and 3 are broader than long. Young examples have antennæ 8-jointed; club ordinary.

Legs well-developed, little hairy; tarsus half length of tibia; inner side of tibia with extremely short spines. Mouth-parts well-developed. Skin strongly chitinated, very densely beset with short hairs; the blunt hairs of some Monophlebids are represented by stout hairs with lanceolate heads; small round glands interspersed, not nearly so numerous as the hairs; there are also larger round or suboval brown spots, arranged more or less in rows. Below the mouth there are two large apertures in the chitinous surface, more or less connected in the middle line, and at the next suture beyond there is a large transverse aperture. Spiracles well-developed.

Hab. On branches of *Mimosa*, *Verulam*, Natal (Fuller, No. 9). Some of the adults show parasite-holes. This is per-

haps the most extraordinary coccid I ever saw ; it reminds one a little of *Icerya koebeleri*, Maskell, but in that insect the erect process is of wax. It may be that the spine serves to prevent the birds from swallowing the insect, while its extreme toughness would make it hard to peck open.

Tachardia, Blanchard (Lac Insects).

This genus contains some very diverse elements, which will no doubt eventually be treated as genera. We may for the present recognize three subgenera :—

(1). *Tachardia* proper. Type, *T. lacca*, the East Indian commercial lac. Female very elongated, vasiform ; the individuals enclosed in masses of lac surrounding the twigs, never separate. I know of only one species of this group.

(2). *Tachardiella*, subg. nov.—Type, *T. cornuta*, Ckll. Female more or less globular ; individuals often separate. This includes the species of America and Australia.

(3). *Tachardina*, subg. nov.—Type, *T. albida*, with the characters given below.

Tachardia albida, n. sp.

Forming smooth yellowish-white masses on the twigs ; the extremely dense and hard lac of the several individuals running together ; masses up to 10 millim. diam., and 30 in length. The individuals are marked externally by orange patches, each presenting a small corrugated or segmented ridge, and an aperture. Cavities for females globular to subpyriform. Male scales of the usual elongated form, red, with a very short dorsal segmented ridge, about one-third of total length of scale.

♀. After boiling in liquor potassæ globular, giving a very fine crimson colour. Skin after boiling transparent, truncate and caudal processes remaining ferruginous. Mounted female on slide about 5 millim. diameter. Truncate processes (or “ lac tubes ”) very short, orifices very small and numerous. Spine apparently absent. Caudal process peculiar ; transversely oblong or subreniform, with a deep posterior notch, on each side of which are two lobules ; lateral hind margins bearing a sharp spine ; surface finely reticulated ; anal ring hidden, only the ends of the numerous bristles projecting. Spiracles large and well-developed. Mouth-parts well-developed, but small, about 135 μ broad ; “ lobes oraux ” (as figured by Targioni-Tozzetti in *T. lacca*) very large.

Larva in female fusiform, narrow, tapering posteriorly, about 560 μ long and 240 broad ; caudal bristles very long.

Hab. On *Mimosa*, Verulam, Natal (Fuller, 5). A very peculiar species ; the first white lac I have seen.

Chionaspis retigera, n. sp.

Scales crowded on twigs ; white, the exuviae orange-brown. ♀. Scale mytiliform, about 1½ millim. long, straight or curved, very convex, the transverse growth-lines rather conspicuous ; second skin

more or less covered with white secretion. ♂. Scale of the usual shape, rather broad, with a barely indicated median keel; exuvia bright orange.

♀. Dark brown, subpyriform, or rather club-shaped, the anterior end being much narrowed; median lobes rounded, very low, rudimentary, but conspicuous because of their dark colour; two other lobes barely indicated by low rounded structures; spines ordinary; squames long and spine-like; anal orifice far from the hind end; five groups of circumgenital glands, the posterior laterals about 10, anterior laterals about 8, median 6; submarginal region with large reticulated patches, transversely elongate, making the five posterior segments, the last pair longitudinally elongate, and situated about the region of the lateral circumgenital glands; mouth-parts large.

♀. Second skin. Mouth-parts between the anus and the hind margin of the body; median lobes large, quadrate, separated by a rather wide interval; margin on each side of median lobes strongly serrate; squames long and spine-like. Some individuals of the third stage, presumably not quite mature, show also the large quadrate median lobes, with wavy-truncate ends.

Hab. Durban, Natal, on native shrub (Fuller, No. 18). Also found by Mr. Fuller at Verulam, Natal. *C. retigera*, as its name indicates, is peculiar for the net-work areas. *Mytilaspis defecta*, Maskell, has similar structures, and may be more closely allied than the different generic reference would suggest.

East Las Vegas, N.M., U.S.A.: May 11th, 1901.

NOTES AND OBSERVATIONS.

ON REARING LASIOCAMPA (BOMBYX) QUERCUS.—The subject of rearing hibernating larvæ has lately been attracting some attention, so my experience perhaps may be of interest. On August 15th, 1900, I had a female *L. (B.) quercus* brought to me, together with about forty eggs that she had laid. These hatched on September 9th and 10th. The young larvæ were supplied with bramble, so that they could be fed during the winter if they should need it. They ate fairly well, but grew very slowly, changing their skins for the first time between September 21st and 27th, and again in the middle of October; early in November they ceased feeding. During the winter I kept them on bramble twigs, which were stuck into pots of damp earth, covering the whole with a glass bell, open at the top. This I placed in the window of a room at the top of the house, where it could get no artificial heat, though, of course, the air inside the glass bell was warmer and moister than the normal atmosphere of the room. A large number died during the winter, especially towards the spring; the remainder, nineteen, began crawling about again at the end of February, and as the new leaves were not then out I had to feed them on the old ones, which three of them seemed too weak to eat, and died. The rest, however, commenced to feed fairly well, and moulted after

a few days. I then sprinkled the leaves with water, and in a few minutes nearly every larva was drinking greedily. During the next few days nearly all died, so that by April 1st there were only three left. These changed skin between April 1st and 5th, and grew quickly, changing again between April 21st and 27th, and again between May 20th and 26th. They fed up well, and grew to a much larger size than any I have had before. Towards the end of June they became restless, continually wandering about on the ground, and disappeared on June 26th, 27th and 30th. As the bottom of the cage was covered with dead leaves, I supposed that they had spun up in them, but when, a week later, I removed the leaves, I could find no trace of the larvæ. On turning over the soil I found the three cocoons, all close to the surface, and kept from actual contact with the soil by being surrounded each with a larger, very loosely woven cocoon, which came to pieces as soon as touched. The cocoons themselves were larger and blacker than any I have had before, and whereas all my others are smooth, these have the short close-set hairs of the larvæ, woven in in such a way that they stick out in all directions, and remain in the fingers when the cocoons are picked up. The first imago emerged on August 2nd, and the others on August 8th, all three being females. The chief points of interest seem to me to be the eager way in which the larvæ drank the drops of water, and the situation of the cocoons. As to the former, whether this was the direct cause or not of so many caterpillars dying, I cannot say, but probably the increase of moisture in the air, arising from watering the plants, had a good deal to do with it, as Mr. Frohawk suggests in the case of *Colias hyale* (*ante*, p. 169). More curious seems to be the situation of the cocoons. All I have had before have been made either on the sides of the cage or on twigs of the food-plant, and nowhere can I find mention of their being made underground. I should be glad to hear if any similar cases have been observed.—K. G. BLAIR; 23, West Hill, Highgate, N.

ABUNDANCE OF *CYANIRIS ARGIOLUS* IN THE METROPOLITAN AREA.—We have always claimed *Cyaniris argiolus* as a Lewisham insect, as it has occurred annually in certain favoured spots hereabout as long back as my memory will carry me, but during the last two years it appears to have been increasing greatly in numbers, reaching its climax, in this respect, during the past few weeks. The spring brood was noted on the wing on May 27th, and the first individual of the summer emergence was seen on July 16th, from which date to the present the species has been on the wing whenever the sun has shone, flying over my little strip of garden, where there is certainly nothing to specially attract it, and about the roads in such numbers as I have never before seen it in the neighbourhood. Reports of a similar abundance reach me from other parts of the London suburbs, and it has been seen flying even in the streets of the City. There is little doubt that this great increase in numbers during the past two or three years is not confined to the London district, but is pretty general throughout the range of the species in this country (*vide* Entom., vol. xxxiii, pp. 14, 203, 226, 303, 351; vol. xxxiv, p. 16, &c.), nor has it been a sudden jump from a normal state of things to a great abundance, as is often the case, where immigration may play a leading part, but rather a

gradual increase during a series of years, the result, no doubt, of a succession of seasons that have been specially favourable to the development of the species.—ROBERT ADKIN; Lewisham, Aug. 5th, 1901.

ENTOMOLOGICAL FAUNA OF BERKSHIRE.—Will Lepidopterists, Coleopterists, Hymenopterists, or Hemipterists who have collected in Berkshire be kind enough to communicate, as early as possible, with W. HOLLAND, or A. H. HAMM; University Museum, Oxford.

BUFF-COLOURED AMPHIDASYS BETULARIA.—I am much obliged to Mr. Pierce and Mr. Mason, and also to Mr. South, that they should have taken sufficient interest in my note on the buff form of *Amphidasys betularia* to write the interesting notes they have written on the subject. I may say, however, that if these buff specimens were produced artificially by chemical means, and were not productions of nature, that fact rather detracts from their interest to me than otherwise. Referring to Mr. South's remarks, in the current number of the 'Entomologist' (xxxiv. 228), as to the coloration of the antennæ, I have examined my specimen, which is a female, and I find that the usual black portions are inconspicuous, and distinctly of a buff colour, though perhaps hardly so pale as the coloration of the wings.—H. AINSLIE HILL.

INSECTS OF MALTA.—I should be much obliged to any reader of the 'Entomologist' who can refer me to any published information on the insects, especially the Lepidoptera, of Malta. The only information I can find is comprised in Messrs. G. F. Matthew's and P. de la Garde's lists in Entom. vols. xxxi. and xxxii. and a few brief notes in Prof. Leith Adams' book 'Notes of a Naturalist in the Nile Valley and Maltese Islands.' Will anyone who can help in the matter kindly communicate with me direct, as I am desirous of making as complete a list as possible?—T. B. FLETCHER; H.M.S. 'Gladiator,' Malta, August 16th, 1901.

CAPTURES AND FIELD REPORTS.

PIERIS DAPLIDICE AT DOVER.—On the 11th inst., while collecting with my friend Mr. Wood, of Ashford. I had the good fortune to take two very good specimens of this rare insect. Both are unfortunately chipped in the left hind wing, otherwise they are in good condition. This is the first time I have taken *P. daplidice*, and I thought when I saw the first one flying that it was an old specimen of *Melanargia galatæa*, but on closer observation it turned out to be a surprise in the shape of a "Bath white." This led to further search, and I was rewarded with the capture of another specimen. There is no mistaking *daplidice* for the other "whites" when on the wing, as their flight is heavier, and they seem to keep closer to the flowers, and do not fly any distance before settling. I should mention that both these specimens are now in the collection of Mr. Sabine.—H. DOUGLAS STOCKWELL; 2, Albert Road, Dover, August 15th, 1901.

PIERIS DAPLIDICE, COLIAS EDUSA, AND C. HYALE AT EASTBOURNE.—While collecting on the Downs near Eastbourne this morning I had

the good fortune to capture a large though somewhat battered example of *Pieris daphnice*. I also took a couple of beautifully fresh *Colias hyale*, and saw but failed to capture *C. edusa*, all on a path of rough down less than a couple of hundred yards square.—ROBERT ADKIN; August 19th, 1901.

COLIAS HYALE NEAR MALDON.—This afternoon I took a male *C. hyale* in a lucerne field within a stone's-throw of my house, and in exactly the same part of the field where I took my first specimen on Aug. 11th last year. Clover and lucerne have done better this year than last, and were nearly all cut (second crop) three weeks ago, so that I hardly anticipate an abundance of *Colias* round here this year.—(Rev.) GILBERT H. RAYNOR; Hazeleigh Rectory, Maldon, Essex, August 16, 1901.

COLIAS HYALE IN ESSEX.—*C. hyale* has again put in an appearance here in some numbers this year. My boys captured ten specimens yesterday morning, and fifteen more this morning. I went down to a field of lucerne in full bloom and soon caught six, two being white females. The eggs I had last year (Entom. xxxiii. 274) hatched, but the young larvæ, which were left outdoors on white clover, were all winter-killed. It does not seem that *C. hyale* will stand our climate without some protection through the winter. We have not seen *C. edusa* at present.—EDWARD A. FITCH; Maldon, August 17, 1901.

COLIAS HYALE IN KENT, 1901.—*Colias hyale* I had not taken again after the specimen recorded *ante*, p. 208, as taken on June 14th until 9th inst., when I saw and took one: since then, on 19th, I saw two and took one, on 20th the same, and on 21st I saw five and took two; to-day I have seen eleven and taken nine. It therefore seems as though this, though in a minor degree compared with last year, is going to be a "*hyale* year."—H. HUGGINS, Jun.: 13, Clarence Place, Gravesend, August 22nd, 1901.

VANESSA POLYCHLOROS AND ARGYNNIS PAPHIA AT WITHERSLACK.—While collecting at Witherslack, Westmoreland, I captured a male *V. polychloros* in splendid condition on July 24th. Mr. George Loxam, who was with me at the time (in fact he saw it first, and drew my attention to it as it came towards me on the wing, tells me he has never heard of this species being taken in that neighbourhood before, although he has collected in company with the late J. B. Hodgkinson about Witherslack for the past thirty years. On August 3rd I took a male specimen, in fine condition, of *A. paphia*: this also is, I believe, a record for Witherslack.—C. H. FORSYTHE; County Asylum, Lancaster. August 9th, 1901.

NOTE ON VANESSA POLYCHLOROS AT LEE.—A specimen of *V. polychloros* was discovered on the landing wall. It remained in the same position for a week (being rather high up, I took it for *V. urtica*), and on July 27th I examined it. It was somewhat battered, and looked like a hibernated specimen, but I suppose it would be too late for that. Directly I put it in the sun it flew away. The locality may be of interest, as I see from Mr. Prout's 'Fauna of the London District' that Dulwich and Croydon are the only two S.E. localities given.—F. M. B. CARE; 46, Handen Road, Lee, S.E., July 29, 1901.

VANESSA ANTIOPA IN SOUTH-EAST LONDON.—We captured this afternoon in our garden here a fine specimen (barring a slight nick in one of the hind wings) of *Vanessa antiopa*. The insect was taken by my children on a fruit tree we had been in the habit of sugaring for moths.—GEORGE B. BROWNE; 43, Southbrook Road, Lee, S.E., August 24th, 1901.

LYCÆNA MINIMA (POLYOMMATUS ALSUS) IN AUGUST. — I caught this afternoon (August 5th) a quite perfect specimen of *P. alsus*. Can this be a late specimen of the early brood? or is there a second generation in August? The butterfly was very common here in June, and I expect the very hot weather we have had has brought out a second generation. I should like to know if others have noticed this.—L. M. SETH-SMITH; Alleyne, Caterham Valley, Surrey, August 5, 1901.

[Probably an individual of a partial second brood. Kane (Eur. Butt.) states that *L. minima* is double-brooded on the Continent, the imago appearing in May to June and July to August.—ED.]

ABUNDANCE OF LYCÆNA ARGIOLUS AT LEE.—Although *L. argiolus* was seen abundantly in the country last year, I did not find it common here. This year, however, it has been very abundant. The first one was seen on May 2nd, and twelve days later I counted nine in twenty minutes in Burnt Ash Road. I saw the last of the spring brood on June 9th. Two specimens of the later brood were seen on July 24th, and since then it has been common here. — F. M. B. CARR; 46, Handen Road, Lee, S.E., July 29, 1901.

PURPLE LARVA OF SPHINX LIGUSTRI. — On August 10th I had a beautiful larva of this species exactly similar to the variety found by Dr. Laver at Colchester in September, 1882, and figured in Buckler's 'Larvæ of the British Butterflies and Moths,' vol. ii. pl. xxii. fig. 2. It was full-fed, and found in a potato-patch at Goldhanger, near here; it did not feed, and went under the same afternoon. Once before I had a purple larva brought me that was more purple than green, but not so dark and distinct as this one. — EDWARD A. FITCH; Maldon, Essex, August 17, 1901.

LARVÆ OF SPHINX CONVULVULI AT MALDON. — Having bred most of the hawks, I was pleased to get two larvæ, nearly full-fed, of this moth on August 14th. They were found by one of my men in a potato-field where *Convolvulus arvensis* is abundant. One is exactly similar to Buckler's figures; the other is green, with a canary-coloured horn—a very pretty variety. I had this larva once before, but did not breed the moth. I hope now to be more successful. Barrett ('Lepidoptera of the British Islands,' vol. ii. p. 27) says "it is doubtful whether there are records of the finding of twenty larvæ, in all, in these islands."—EDWARD A. FITCH; Maldon, Essex, August 17, 1901.

SPHINX CONVULVULI LARVÆ IN LANCASHIRE. — On August 19th my brother and I took on the Lancashire coast sand-hills twenty-six larvæ of *S. convulvuli*. They were feeding on wild convolvulus or bindweed, and varied in length from $2\frac{1}{2}$ in. to $3\frac{1}{2}$ in. One of them is of a brownish colour and another black. In the largest examples the black stripes on the sides are almost absent. As Newman ('British Butterflies and Moths') states that he had never seen the larvæ or pupæ, I thought

therefore that this record was perhaps worth sending.—F. J. GRIMSHAW; Carr House, Rawtenstall, Lanes, August 21, 1901.

SPHINX CONVULVULI IN ESSEX.—We caught an example of *S. convulvi* at tobacco bloom last evening, and this evening we captured two fine specimens. Each evening we missed one.—E. A. FITCH; Maldon, Essex, Aug. 19th, 1901.

SPHINX CONVULVULI IN SUSSEX.—I have received a fine specimen of *Sphinx convulvi*, taken by Mr. Pullen in a cornfield at Eartham, Sussex, on August 16th.—L. S. GILES; 1, London Road, Norbury, S.W., August 25th, 1901.

ACRONYCTA ALNI IN WARWICKSHIRE.—I found a very fine larva of this species on August 12th feeding on oak. It has now spun up in a hollow stalk of broad bean.—W. KISS; Greenfield House, Dorridge, near Birmingham.

PLUSIA MONETA AT BICKLEY, KENT.—I have to record the capture of yet another specimen, taken off a fence on July 27th, and brought to me in very fine condition. This species appears to be fairly abundant this year between here and Tunbridge Wells, this being the third to enrich my cabinet during the present month.—A. J. LAWRANCE; Bromley Common, Kent, July 29, 1901.

PLUSIA MONETA AT READING.—On July 13th my son Douglas Harry Butler, four years of age, boxed a specimen of the above in my back garden; it was at rest on an ivy-leaf.—W. E. BUTLER; Hayling House, Oxford Road, Reading.

CALLIMORPHA HERA IN ENGLAND.—On August 7th, Mr. W. W. Rhoades, of Honiton Clyst, captured one specimen of *C. hera* within five miles of Exeter, and saw another which he failed to take. This moth has been occasionally taken in other seasons near Exeter, and, it is to be hoped, has fairly established itself in the locality.—(Rev.) W. J. LEIGH PHILLIPS; The Cottage, Tavistock, August 18, 1901.

SESIA ANDRENIFORMIS IN KENT.—Whilst my son and I were out near here on July 17th, the latter took a clear wing which turns out to be the rarest of the British *Sesiæ*—*viz.* *S. andreniformis*. It was settled on a leaf of the wild cornel or dogwood, *Cornus sanguinea*. I should have recorded it sooner, but was loth to believe in our good luck, though the insect corresponded perfectly with the description given in Newman's 'British Moths,' but having now had the opportunity of submitting the same to my friend the Rev. C. R. N. Burrows, the latter says there is not the least doubt as to the identity of the insect.—H. HUGGINS, Jun.; 13, Clarence Place, Gravesend, August 22nd, 1901.

LARVÆ OF NYSSIA LAPPONARIA.—I think many of your readers will be interested to hear that last year I took two larvæ of *Nyssia lapponaria* from which one imago, a female, emerged. Last July I again obtained larvæ in the same locality in Perthshire. I believe Mr. Christy is the only other entomologist who has taken this insect recently in Britain. According to Barrett, he found his larvæ on hawthorn and birch, whereas mine were feeding on low plants—ling,

bell-heather, and bog-myrtle.—E. A. COCKAYNE; 6, Tapton House Road, Sheffield, Aug. 22nd, 1901.

LUCANUS CERVUS IN LONDON. — On July 24th a fine male *L. cervus* was given to me. It had been found in an area of our street. Is not this rather an unusual insect to occur in such a part of London (Pimlico)?—N. L. GILLESPIE; 8, Ranelagh Grove, S.W., August 10.

[This species has been fairly common at Balham this year.—ED.]

GYMNUSA BREVICOLLIS IN YORKSHIRE.—I captured a specimen of this beetle under a stone in a stream near Staithes on June 14th.—N. L. GILLESPIE; 8, Ranelagh Grove, S.W., August 10, 1901.

NOTE ON RHIZOTROGUS SOLSTITIALIS.—This beetle was very abundant here about midsummer. We could have caught scores almost any evening as they buzzed round the fruit trees in the garden. It would be interesting to know whether this insect was observed in such numbers in other localities.—PHILIP J. BARRAUD; Bushey Heath, Herts, August, 1901.

GERRIS COSTÆ (*H.-Sch.*) AT DEAL. — I was surprised to find this, as the species is, as a rule, alpine and subalpine both here and on the Continent.—G. W. KIRKALDY.

SIREX GIGAS.—I caught a specimen of *Sirex gigas* here on the morning of August 1st. Can you in any way account for the occurrence of this insect? — THOS. B. BLAKEBOROUGH; Ashlea, Brighouse; August 14, 1901.

[The larva of this species lives in the solid wood of fir trees, usually unhealthy ones. Eggs, however, have been known to be deposited in sound trees that have been recently cut down. The occurrence of the perfect insect in places where there are no firs is most probably due to its having been introduced, in one of its earlier stages, with the timber used in house-building, &c.—ED.]

NOTES FROM THE CHESTER DISTRICT. — This has been a record year with us for the handsome geometer *Anticlea derivata*. An old, disused and neglected country road—grass-grown, and neglected even by the insect-hunter, and with plenty of dog-rose and sallow on either side—turned out to be a regular home for the pretty moth. *Hypsipetes impluviata* and *Cidaria suffumata* were equally common in this lane, along which tradition says William III. marched his army to Parkgate previous to the battle of the Boyne, in 1690. Now, it is as silent and lonely as a place can well be. All traffic diverted, and entirely neglected, except where absorbed here and there by adjacent fields, a locality like this can only be worked in dry weather, and we had the advantage of an almost rainless May when the three species were on the wing. Among the early Noctuas *Pachnobia rubricosa* and *Tanio-campa pulverulenta* (*cruda*) were especially noticeable in the district. Day-work in June and July was chiefly devoted to two objects—(1) to find, if possible, the pupa-case of the dragonfly *Leucorrhinia dubia*, and (2) to see in how many Delamere Forest localities the butterfly *Cænonympha typhon* (*davus*) still lingered. In the first we were disappointed. No amount of searching, even on hands and knees, in the most horrible sponges and morasses, could unravel the mystery. Only one clue did I discover which may possibly lead to the situation.

One day I netted a specimen of *L. dubia* which had its left lower wing rather crippled. This wing was *crusted* with the black, peaty mud of the pools about. The pupa-case, then, is probably always in the water. In the second of our ambitions we got on "gradely," as they say in Lancashire. We found no less than four *davus* localities—and far be it from me to say where they are—nay, far be it from me to say more than that the numbers of the butterfly were satisfactory. There ought to be five localities, but from the fifth *davus* has long since been removed by over-collecting. Any indication of a similar process on the remaining spots will probably result in a curtain between *davus* and the public, and so history will repeat itself. For *davus*—at any rate the Delamere form—is a handsome insect, and variable. To the entomologist who has a weakness for "spots" and "under sides" it is unique. These eye-like markings vary from the size of a pin's head to about a quarter of an inch across. As to shape, they are usually circular; but there is a form which has them oval, and there is another where the spots are acutely pointed towards the wing-margins, and remind one, in shape, of ears of oats or barley. Again, the ground-colour of the under sides is sometimes *white*, and the large, basal, brown area of the secondaries is divided into what look like a couple of deeply-indented leaves. Still, the upper surface is frequently so handsome and so well spotted that it is often puzzling which side to show. If the upper surface be dark, the spots numerous and large, and the lower wings almost black—a fine but infrequent form—then there can be no doubt about the matter. *Lycana ægon* has been, on certain Delamere heaths, in even greater numbers than last year. We did not take one. But the splendid *Nemeophila russula*—aglow with yellow and crimson—did not get off so easily, even in the tropical heat, when we could catch it, which was not always. At the electric lamps there has been a marked falling-off in the numbers of certain species—for examples, *Amphidasys betularia* (I took a fine intermediate form on the night of June 1st), *Notodonta dictæa*, *N. dictæoides*, *Xylophasia monoglypha* (*polyodon*), *Smerinthus ocellatus*, and *S. populi*. On the other hand, I have to report three species new to the lamps, as far as I know—*A. strataria* (*prodromaria*), one, April 18th; *A. derivata*, one, May 14th; and *Abraxas ulmata*, one, July 3rd. Other occasional visitors were—*Drepana binaria* (*hamula*), one, July 8th; *Leucoma salicis*, one, July 17th; and *Zeuzera pyrina* (*æsculi*), about a dozen in July. The first brood of *Plusia festuæ* appeared early in May, the second on July 20th. The hot, sometimes tropical, weather from June 20th to July 21st was no doubt responsible for the early appearance of the second brood.—J. ARKLE; Chester.

ODONATA AND LEPIDOPTERA AT LLANDRINDOD (RADNORSHIRE).—Mr. J. Lyon Denson, of Chester, whilst staying at Llandrindod Wells in the first half of June, kindly sent me the following species which he captured there. ODONATA: *Calopteryx virgo*, sixteen males, four females. LEPIDOPTERA: *Pieris brassicæ*, *P. rapæ*, *Euchloë cardamines*, ten *Argynnis euphrosyne*, *Pararge megera*, *Ctenonympha pamphilus*, five *Hesperia sylvanus*, *Phytometra viridaria* (*ænea*), and a larva of *Vanessa polychloros* which spun up, but unfortunately emerged a cripple. The fine weather for insect-hunting broke up on the 12th, and people had to take to overcoats again for a week.—J. ARKLE; Chester.

NOTES ON LEPIDOPTERA DURING JULY AND AUGUST, 1901. — Last month (*ante*, p. 228) I referred to the early appearance of many insects this year. Since then imagines of *Smerinthus populi* and *S. ocellatus* have emerged, the data of which are as follows:—*S. populi*, larvæ from ova June 4th, pupated July 3rd; imago appeared July 25th, at 7 p.m. I looked at them for the first time, and found a male and female *in coitu*; I kept the female alive, and by the 30th she had laid 125 ova. The second brood of larvæ appeared on Aug. 5th, and at the time of writing are in a flourishing condition. *S. ocellatus*, larvæ from ova June 5th, pupated July 12th; imago appeared Aug. 9th. I had only bred half a dozen of these, and curiously enough all the moths were females, so I have not succeeded in getting a second brood. *S. tiliæ* and *Sphinx ligustri* also are much in advance as compared with last year, for *tiliæ* pupated July 7th, though the imagines have not yet appeared; and *ligustri* pupated on July 17th. The dates last year for the pupating of the four above-mentioned insects were:—*S. populi* and *S. ocellatus*, July 30th; *S. tiliæ*, July 27th; *S. ligustri*, Aug. 30th. At 6.45 p.m., on July 5th, I observed *Macroglossa stellatarum* hovering over a flower in my garden. It was completely in the shade, and stayed there several minutes, never once settling all the time. On July 7th, when I first saw my breeding cage at 7 a.m., I found that four imagines of *Catocala nupta* had emerged; but even at that early hour they had had time to knock themselves about, for a little piece was out of the wings in each one. The rest of the imagines came out at intervals from the above date till July 17th, never again more than two together, and all these were perfect specimens. The larvæ had emerged on April 27th, and they begun to pupate, some in moss and others between two leaves of their food-plant, willow, on June 4th. On July 8th the first pupæ appeared from my batch of *Nemeobius lucina*. On July 10th we had a good day on Ranmore Common, where *Argynnis adippe* and *A. aglaia* were out in great numbers; but they were very wild and difficult to catch, as the going was bad among the gorse and bramble-bushes. A friend of mine, who takes a great interest in entomology, though he does not collect, told me that on the afternoon of July 12th, while he was walking in Horning churchyard, in Norfolk, he observed a very fine specimen of *Papilio machaon* on a sweet-william blossom. He got quite close to it, and could have caught it easily if he had had a net with him. After some time it left the flower, and, hovering in a circle for a few moments, alighted again on the same place; but in about ten seconds it flew right away high up in the air, and he did not see it again. On July 13th a batch of larvæ appeared from ova of *Sphinx pinastri*, which I obtained from abroad. They did very well until Aug. 11th, when for some reason or other they all died. Most of them had successfully passed the fourth moult, and were eating at a great rate; but they suddenly ceased feeding and shrivelled up. On the same date I found a great number of larvæ of *Euchelia jacobææ* feeding on ragwort, and for the next ten days or so I kept finding them. They had all pupated by the end of the month. On July 16th I obtained a good number of *Hesperia comma* on Ranmore. I knew they must be about in our neighbourhood, but had never found them before. The same remark applies to *Lycæna corydon*, for in former years I had always succeeded in getting

one or two specimens, but had never found their haunt. This year, however, on July 20th, I came upon it not two hundred yards from where I had been searching before. They were in the utmost profusion on the side of a chalk-hill, and very pretty the males looked as the sun caught the sheen of their wings. A second brood of *L. argiolus* was also out on that date, and *Satyrus semele* appeared plentifully. On July 19th the first imago of my *Ennomos fuscantaria* appeared, and they are still coming out at intervals. In a field near Coldharbour, on Aug. 7th, a friend of mine took a fine male of *Colias hyale*, but I have not been able to go there since.

I am now staying near Lynton, in North Devon, and have only had one day's entomology—Aug. 19th—when I took my net along the Lyn Valley for about five miles. *Argynnis paphia* was very common and easy to catch, but, except for one fresh female, all were in bad condition. *A. adippe* was to be seen, too, also in poor condition. Any number of *Pararge egerides* could be taken among the trees and woodland paths, and such things as *L. icarus*, *Polyommatus phleas*, *Epinephele ianira*, and *E. tithonus* were absolutely swarming. I took two fine specimens of *Vanessa io*, and one *V. polychloros*. *A. paphia* showed a great liking for the bramble-bushes, and also for thistles, from which latter it could easily be taken. But my trip to Devonshire is more for health's sake than for entomology, and so my notes for August are, I fear, somewhat scanty.—F. A. OLDAKER; Parsonage House, Dorking, Aug. 20th, 1901.

SOCIETIES.

SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—July 11th, 1901.—Mr. W. J. Lucas, B.A., Vice-President, in the chair.—Mr. Kemp exhibited a short series of the Coleopteron *Dytiscus punctulatus*, taken by Mr. F. Enock at Wisley, together with the Odonata, *Brachytron pratense*, *Calopteryx splendens*, *Erythromma najas*, *Agrion pulchellum*, *Ischnura elegans*, with var. *rubra*; the Trichoptera, *Phryganea grandis*, *Limnophilus marmoratus*, and *L. rhombicus*; and the Neuropteron, *Raphidia maculicollis*, all taken at the Byfleet Field Meeting.—Mr. F. M. B. Carr, a series of *Thecla rubi* from Wrotham, Kent, including a specimen with a cream spot on the fore wings.—Mr. South, a series of *Zonosoma porata*, bred from a female taken at Oxshott, and called attention to the unusual brown coloration of some of the specimens; also an example of *Eurrhynx urticata* with confluent spots, taken by a boy in Balham. On behalf of Mr. Mitford he showed three varieties of *Melitæa cinxia* (1) having transverse lines of fore wings absent, (2) central transverse lines partially effaced, (3) central spots of fore wings confluent.—Mr. Montgomery, pupæ of *Leucophasia sinapis*, one specimen having the longitudinal line pink instead of white.—Mr. Bishop, living larvæ of *Eugonia polychloros*, and pupæ of *Euchloë cardamines*.—Mr. Kirkaldy, various genera of *Fulgorinæ* (lantern flies), showing the remarkable development of the head; a number of ornate species of *Rhynchota*, including the pale blue *Hansenia pulverulenta*, the pale green *Geisha punctatissima*, the delicate rose *Cerynia maria*, and a number of coffee pests from Ceylon.

—Mr. Colthrup, two striking vars. of *Smerinthus tilia*: (1) ground colour pale fawn on fore wings with indistinct markings, pinkish tint on hind wing; (2) ground of fore wing dark brown with very intense green markings, the band represented by a small spot only.—Mr. Lucas read the Report of the Field Meeting held at Byfleet on June 1st.—Mr. Clark read a few notes on a "Walk in his Garden," and showed various specimens, including a grasshopper which had not been identified, and was probably new.

RECENT LITERATURE.

Familiar Butterflies and Moths. By W. F. KIRBY, F.L.S., F.E.S., &c.
 $9\frac{3}{4} \times 7\frac{1}{2}$ in. Pp. i-xiii and 1-114, with 18 coloured plates.
 London: Cassell & Co. 1901.

As an introduction to the larger work, 'European Butterflies and Moths,' by the same author, the present volume should be useful. It deals in a popular style with the subject, and illustrations are given of many of the well-known British species, and of some others that are not inhabitants of these islands. The English name of the species is used in every case, but the Latin names are added in brackets, and these are the same as those employed in the larger work referred to. The plates are, on the whole, very good, and some of the figures are excellent; the printing and general get-up are all that could be desired, and to young people with a bent for collecting moths and butterflies the book should be very acceptable.

Proceedings of the South London Entomological and Natural History Society for 1900. Together with the President's Address. Pp. i-xxvi and 1-117. A chart and four plates. Hibernia Chambers, London Bridge, S.E.

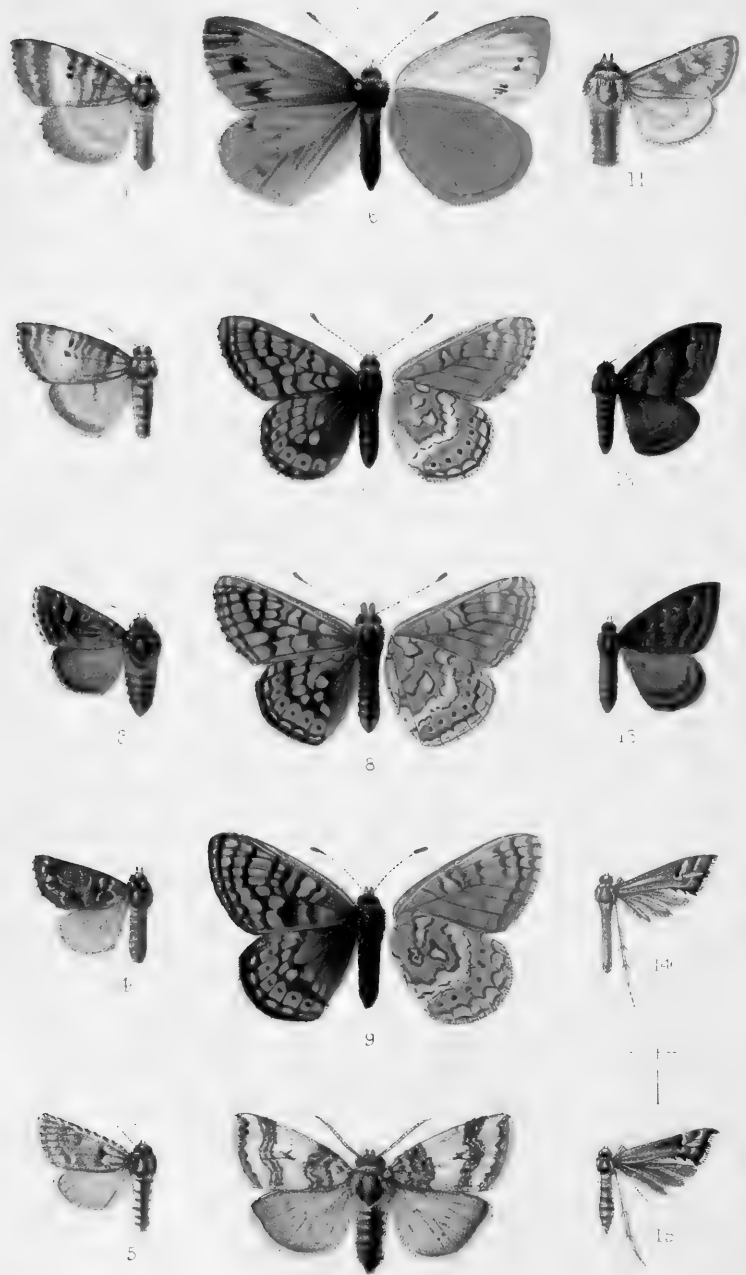
FULL reports of the five Field Meetings held during the year are given; that of the Banstead excursion on June 16th is accompanied by a capital sketch map, prepared by Mr. B. W. Adkin, which should be useful to anyone wishing to further explore this rural locality.

Among the entomological papers is one "On the Pupation of *Cossus ligniperda*," by Mr. Robert Adkin, in which the method of pupation is very fully discussed. Another interesting paper is by Mr. F. Noad Clark, and entitled "On the Ova of Lepidoptera." This is illustrated by an excellent plate, reproduced from some beautiful photographs taken by the author. Dr. Chapman's contribution, "On Some Wing Structures in Lepidoptera," is a valuable and highly instructive paper; it is illustrated by two plates of details photographed by Mr. Clark.

The President (Mr. W. J. Lucas), in his Address, enters largely into matters connected with the Odonata, and among other things he deals with the growth of our knowledge as regards the earlier stages of these very interesting insects.

Taken as a whole, the volume for 1900 is much ahead of any of this Society's previous publications, although it is less bulky than some of them.





ECKnight del

West, Newman, chromo

Varieties of Irish Lepidoptera

EXPLANATION OF PLATE IV.



FIGS.

| | | |
|--------|--|-------------------|
| 1 & 2. | <i>Cymatophora duplaris</i> var. <i>argentea</i> , Tutt. | Entom. xxvii. 126 |
| 3. | <i>Dianthæcia capsophila</i> var. | „ xxix. 19 |
| 4. | <i>Bryophila muralis</i> var. <i>impar</i> , Warr. | „ xxvii. 209 |
| 5. | „ „ „ | „ xxvii. 209 |
| 6. | <i>Pieris napi</i> var. <i>flava</i> , Kane | „ xxvi. 119 |
| 7. | <i>Melitæa artemis</i> , Fabr. | |
| 8. | „ <i>aurinia</i> var. <i>præclara</i> , Kane | „ xxvi. 159 |
| 9. | „ „ var. <i>scotica</i> , Robson | „ xxvi. 187 |
| 10. | <i>Cymatophora</i> or var. <i>gaëlica</i> , Kane | „ xxvii. 125 |
| 11. | <i>Xylocampa areola</i> var. | „ xxix. 160 |
| 12. | <i>Camptogramma bilineata</i> var. <i>isolata</i> , Kane | „ xxxi. 85 |
| 13. | „ „ var. <i>infuscata</i> , Kane | „ xxxi. 85 |
| 14. | <i>Platyptilia tesseradactyla</i> , Linn., ♂ | „ xxxi. 209 |
| 15. | „ „ ♀ | „ xxxi. 209 |

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[No. 461.

ABERRATION OF *GONOPTERYX RHAMNI*.

By W. J. LUCAS, B.A., F.E.S.



ON July 29th, 1901, Mr. G. Hooker took, near Lyndhurst, in the New Forest, a rather strange aberration of *G. rhamni*, ♂. Between the nervures and in the discoidal area were large oval rings of very pale brownish orange, the colour inside being a very pale green. This is on the under surface; the markings scarcely shew through to the upper. The specimen was taken quite by chance, for the rings are so pale that they would not be noticeable when the insect was flying. The figure will shew the size and position of the rings. In other respects the insect is normal.

Kingston-on-Thames.

DESCRIPTION OF A NEW GENUS OF BEES FROM INDIA.

By PETER CAMERON.

AGLAOAPIS, gen. nov.

Wings short, not reaching to the apex of the third abdominal segment. There are two closed cubital cellules; the first is longer than the second above and below; the radial cellule has the apex rounded and not much narrowed; the first recurrent nervure is interstitial; the second is received not far from the apex of the cellule. Eyes large, slightly converging below, and reaching to the base of the mandibles; the ocelli are in a curve. Labrum visible, short, obliquely depressed. Mandibles bidentate; the apical tooth is much larger than the other. Scutellum bluntly projecting laterally at the apex; the middle slightly projects, and is keeled; the post-scutellum is keeled in the middle. Median segment short; the basal area large. Legs short and stout, pilose; the tibiæ and tarsi not densely covered with long hair. The basal segment of the abdomen is transverse at the base, and is bordered at the base by a distinct keel; the apical segment is longer than the penultimate, and is distinctly incised at the apex; the sides of the incision are straight and oblique, and form two distinct lobes, which become gradually narrowed from the base to the apex; the lower edge is stoutly keeled. The antennæ are short and stout; the third joint is not much narrowed; the head is well-developed behind the eyes, with the occiput transverse; the apex of the scutellum does not project over the post-scutellum, and only over the median segment at the sides; the claws and spurs are simple; the tegulæ are large; the head and thorax are thickly covered with short white pubescence; the abdominal segments are narrowly banded at the apex with white pubescence. There is no ventral scopa. The front calcaria are normally curved; the claws simple.

Belongs, if anywhere, to the Stelididæ, and comes nearest perhaps to *Parevaspis*, which may be known from it by the projecting apex of the scutellum, which is incised at the apex; by the second recurrent nervure being received beyond the second transverse cubital nervure, and not in the second cubital cellule; by the apex of the abdomen not being deeply incised in the middle in the female; and by the longer wings. The wings in the present genus are shorter than usual. It is easily known by the form of the scutellum, by the transversely keeled basal segment of the abdomen, and by the deep incision in the apical segment. The colour—black, with the basal two or three segments of the abdomen red—is peculiar, and does not occur with any other Indian species. The genus is doubtless, like *Stelis* and *Parevaspis*, a parasitic one.

AGLAOAPIS BREVIPENNIS, sp. nov.

Black, thickly covered with white pubescence; the apices of the abdominal segments banded with white pubescence; the greater part

of the first and the whole of the second segment, and sometimes the third, red; the wings hyaline, the stigma and nervures black. Female. Long. 6-7 mm.

Hab. Bombay (G. A. J. Rothney).

Antennæ black, the flagellum with a faint brownish tint; bare, the scape covered with white hair. Front and vertex strongly and closely punctured; the front, the sides of the face, and of the clypeus thickly covered with white pubescence; the central parts and the vertex much more sparsely covered with similar pubescence. Mandibles black, rufous near the apex; the base punctured, and covered with white pubescence; the middle above hollowed. Mesonotum and scutellum closely rugosely punctured, and covered with white pubescence, which is thicker and more fulvous in tint round the eyes; the post-scutellum is thickly covered with white longish pubescence. The base of the median segment is stoutly longitudinally striated; its apical slope laterally is covered thickly with white pubescence. Pleuræ thickly covered with white pubescence. Legs black, thickly covered with white pubescence; the calcaria testaceous. Abdomen closely and distinctly punctured; the punctuation on the basal two segments is stronger and more widely separated than it is on the others.

BUTTERFLY COLLECTING IN AUSTRO-HUNGARY IN 1900.

BY HENRY C. LANG, M.D., F.E.S.

THE following notes are a record of butterfly collecting in Austria and Hungary during one month of the summer of 1900, from June 21st to July 21st. The dates and localities were as follows:—Salzburg, June 21st to 28th; Berchtesgaden, June 26th to 28th; Modling, near Vienna, June 29th to July 2nd; Buda Pesth, July 3rd to 9th; Herculesbad, July 12th to 20th; Orsowa, July 20th.

At Salzburg there were very few butterflies on the low ground; almost everything was collected on the wooded hills a few miles east of the town.

At Berchtesgaden, in Bavaria, but a few miles from Salzburg, there is a fine opportunity for mountain collecting, but unfortunately the weather was dull or rainy, with the exception of one day—June 27th—when I collected in the woods above the village.

At Modling, near Vienna, the weather was fine, but some of the best species found there were not yet on the wing (one *Neptis lucilla* was taken).

At Buda Pesth we had very unfavourable weather; the days were mostly showery, and at times windy and cold. Collecting was mostly on the Schwabenberg, a mountain reached by rack-and-pinion railway from the town. It is an interesting locality, covered with woods of oak and beech, and with open grassy slopes.

Herculesbad is situated in a deep river valley at the extreme south-east corner of Hungary, surrounded by densely wooded heights of a considerable elevation. From the summits of these one gets an extensive view of immense forests stretching out as far as the eye can reach into Roumania and Servia. The trees are principally beech, many of them being of gigantic stature, and the country is wild in the extreme. The valley of the Czerna, in which Herculesbad is situated, resembles somewhat the dales of Derbyshire on a larger scale, the river running rapidly between limestone crags. In this valley *Neptis aceris* was very abundant, and was a very interesting object on account of its exceedingly graceful flight. I have seen it flying in front of the cafés and the casino garden, as well as in the wild places in the neighbourhood. *Neptis lucilla*, as well as *Limenitis sibylla* and *L. camilla*, are also to be taken in this locality. On the woods, on the steep hill-sides, *Pararge roxelana* and *P. climene* are sometimes abundant, and on the high ground *Erebia melas*. In this valley I took what is undoubtedly *Lycæna zephyrus*. I do not think this species has been previously recorded from Hungary. *Argynnis paphia* is very large and brightly coloured. The commonest butterfly is probably *Melanargia galatea* var. *procida*. *Thanaos tages* var. *cervantes* is common on the banks of the river. On the Damogled, a height on the eastern bank, *Erebia æthiops* var. *leucotenia* was common, and on one occasion I took what I believe to be a hybrid between this form and *E. ligea*, which also occurs. The weather here was very uncertain; the first three days of my stay were lost as far as collecting was concerned; we had between seventy and eighty hours of rain without any cessation; then followed four very fine cloudless days, and afterwards more or less showery ones.

I here subjoin a list of the species taken:—

PAPILIONIDÆ.

Papilio podalirius. Buda Pesth; Herculesbad. Common.—Var. *zancleus*. Herculesbad; Belgrade, July 22nd.

P. machaon. Buda Pesth. Not very common.

PIERIDÆ.

Aporia cratægi. Salzburg; Modling; Herculesbad. Common.

Pieris brassicæ. Salzburg; Berchtesgaden; Modling; Buda Pesth; Herculesbad. Common.

P. rapæ. Ditto. Common.

P. napi. Ditto. Common.—Var. *bryoniæ*. Berchtesgaden.

P. daphidice. Buda Pesth; Herculesbad. Common.

Euchloë cardamines. Salzburg; Berchtesgaden. Rare.

Leptidia sinapis. Salzburg; Berchtesgaden; Modling; Buda Pesth; Herculesbad. Common.

Colias edusa. Modling; Buda Pesth; Herculesbad. Common.

C. hyalæ. Salzburg; Berchtesgaden; Modling; Buda Pesth; Herculesbad. Common.

Gonopteryx rhamni. Berchtesgaden; Modling; Buda Pesth; Herculesbad.

Nymphalidæ.

Apatura ilia var. *clytie*. Several specimens came on board the steamer on the Danube between Vienna and Buda Pesth. I also saw it at Orsowa.

Limenitis camilla. Herculesbad. Common.

L. sibylla. Herculesbad. Rarer than the last.

Neptis lucilla. Modling; Herculesbad. Rare.

N. aceris. Herculesbad. Common.

Pyrameis atalanta. Buda Pesth; Herculesbad. Rare.

P. cardui. Buda Pesth; Herculesbad. Common.

Vanessa io. Buda Pesth; Herculesbad. Rare.

V. urticæ. Salzburg; Berchtesgaden; Modling; Buda Pesth; Herculesbad.

V. xanthomelas. Herculesbad. Only one specimen.

V. polychloros. Buda Pesth. Rare.

V. antiopa. Salzburg; Buda Pesth. Not common.

Polygonia c-album. Salzburg; Buda Pesth; Herculesbad. Fairly common.

Araschnia levana. Berchtesgaden. One specimen.

Melitæa maturna var. *urbani*. Salzburg. Only one specimen.

M. phæbe. Buda Pesth; Herculesbad. Common.

M. didyma. Salzburg; Buda Pesth; Herculesbad. Common.

M. athalia. Salzburg; Buda Pesth; Herculesbad. At Buda Pesth extremely abundant; in some spots the ground was literally carpeted with them.

M. aurelia. Buda Pesth.

M. dictynna. Berchtesgaden. Fairly common.

Argynnis euphrosyne. Salzburg; Berchtesgaden.

A. dia. Modling; Buda Pesth; Herculesbad.

A. ino. Salzburg.

A. daphne. Herculesbad. Not uncommon.

A. amathusia. Herculesbad.

A. lathonia. Buda Pesth; Herculesbad. Common.

A. aglaia. Berchtesgaden.

A. adippe. Modling; Buda Pesth; Herculesbad.

A. paphia. Herculesbad.

Melanargia galatea. Salzburg; Berchtesgaden. — Var. *procida*. Herculesbad.

Erebia æthiops var. *leucotænia*. Herculesbad.

E. ligea. Herculesbad.

Satyrus circe. Buda Pesth. Very common.

S. semele. Modling; Buda Pesth.

Pararge egeria. Salzburg; Berchtesgaden; Modling; Buda Pesth; Herculesbad.

P. roxelana. Herculesbad. Five specimens only.

P. megæra. Herculesbad. Not common.

P. hiera. Salzburg. Common.

P. mæra. Salzburg; Berchtesgaden; Buda Pesth; Herculesbad.

P. achine. Berchtesgaden. Six specimens.

Aphantopus hyperanthus. Salzburg; Berchtesgaden; Modling; Buda Pesth; Herculesbad. Abundant.

Epinephele janira. Ditto. Abundant.

E. tithonus. Ditto.

Cænonympha arcania. Ditto. Usually abundant.

C. pamphilus. Ditto. Common.

C. tiphon. Salzburg; Berchtesgaden. Locally abundant.

ERYCINIDÆ.

Nemeobius lucina. Salzburg; Berchtesgaden; Modling; Buda Pesth; Herculesbad. Commonest at Herculesbad.

LYCÆNIDÆ.

Thecla ilicis. Modling; Buda Pesth; Herculesbad. Common.

T. acaciæ. Buda Pesth. Rare.

T. spini. Buda Pesth; Herculesbad. Common.

T. w-album. Herculesbad. Two specimens.

Callophrys rubi. Salzburg; Buda Pesth. Not common.

Zephyrus quercus. Herculesbad. Rare.

Chrysophanus virgaureæ. Herculesbad.

C. hippothoë. Salzburg; Berchtesgaden. Local.

C. alciphron. Herculesbad. One specimen.

C. phlæas. Herculesbad.—Var. *eleus*. Herculesbad.

Lampides telicanus. Herculesbad. Two specimens.

Lycæna argiades. Buda Pesth; Herculesbad. Common.

L. argus. Salzburg; Buda Pesth; Herculesbad.

L. argyronomon. Salzburg; Buda Pesth; Herculesbad.

L. zephyrus. Herculesbad. One specimen.

L. orion. Modling; Buda Pesth; Herculesbad. Very blue above, and with large spots on under side, at Herculesbad.

L. astrarche. Salzburg; Buda Pesth; Herculesbad.

L. icarus. Salzburg; Berchtesgaden; Modling; Buda Pesth; Herculesbad. Common.

L. hylas. Berchtesgaden. Rare.

L. bellargus. Herculesbad. Common. Also at Belgrade.

L. corydon. Buda Pesth; Herculesbad. Local.

L. admetus. Buda Pesth. Local.

L. damone. Modling.

L. minimus. Salzburg; Berchtesgaden; Modling; Buda Pesth.

L. semiargus. Salzburg; Berchtesgaden; Modling.

L. melanops. Buda Pesth. One specimen.

L. arion. Berchtesgaden; Modling; Herculesbad.

Cyaniris argiolus. Berchtesgaden; Buda Pesth.

HESPERIDÆ.

Heteropterus morpheus. Buda Pesth. Locally abundant in a wood on the Schwabenberg.

Adopæa lineola. Buda Pesth. Common.

A. thaumas. Buda Pesth; Herculesbad. Common.

A. actæon. Herculesbad. Common.

Augiades sylvanus. Buda Pesth; Herculesbad.

Carcharodus lavateræ. Buda Pesth ; Herculesbad. Common.

C. alceæ. Herculesbad.

Hesperia alveus. Herculesbad.—Var. *fritillum*. Herculesbad.

These are all the species that I am able to record during June and July, 1900. No doubt, had the weather been less unfavourable, many more species would have been added to the list, especially in the more elevated regions. It will be noticed that very many common species are conspicuous by their absence, and several species which might have been reasonably expected to be taken, were not found, such as *Colias chrysotheme*, *C. myrmidone*, *Vanessa l-album*, *Erebia melas*, *Pararge climene*, &c.

All Saints Vicarage, Southend-on-Sea.

LEPIDOPTERA IN AUGUST IN SOUTH DEVON.

By G. H. HEATH, B.A., B.Sc.

WITH glowing visions of *Laphygma exigua* and *Leucania albipuncta* before my eyes, I arrived at Babbicombe on Friday, Aug. 2nd, and promptly got to work. The first two nights were spent on Oddicombe Beach, where white flower-heads were sugared for *Leucania putrescens*, with very little result, the few specimens seen being badly worn ; in fact, out of a dozen seen at various times and places, only two were in fair condition. It seems to have been an early season for this insect, some ninety specimens being taken by one collector from flower-heads (unsugared) in July. Lantern and net produced a good set of *Gnophos obscuraria*, some very dark forms turning up.

The rest of the time was spent on the cliffs towards Torquay. I was fortunate in securing a run adjoining one of the places where *Lithosia caniola* is taken. The habits of this insect are very interesting. It seems to occur all round this piece of coast from Babbicombe to Torquay, but to be found in greater numbers at certain favourable spots. It spends the day on the perpendicular face of the cliff, and at dusk, or sometimes just before, it flies in numbers from its resting-place to the gorse-bushes on the steeply-sloping brow of the cliff. The female probably comes up first, and hides herself in the bushes, and the males follow in search of her. So great is the attracting power of the females, that as many as eight males were taken, hovering over the same bush, with one sweep of the net. This flight only lasts from ten to fifteen minutes, and on favourable nights the collector has his powers of rapid netting and boxing strained to the breaking point. In choosing a position there is a choice of evils. One may stand on the path on the brow of the cliff, some distance above the real edge, where *L. caniola* is not always so plentiful, but where

there is a little room to move ; or one may scramble down 30 ft. or so on to the extreme brink, and net the insects as they come up, with the pleasant thought that a too excited step will land one some 150 ft. below on the rocks or in the sea. That *L. caniola* does not confine itself entirely to the cliffs, I proved by taking three specimens from a lamp-post on my way home about half-past ten. My largest take on any one night was sixteen, and only once in three weeks did I fail to get any. The total result was about sixty specimens ; their condition very fair for such a fragile insect. Only one that I saw really looked as if just out.

For the first week the wind was in the south-west, and my run nicely sheltered, but nothing worth taking turned up. Then came a spell of strong east wind, and the results grew worse and worse, until matters reached a climax on the 21st, when only six very common things were found on about one hundred posts. This proved to be the darkness before the dawn, which came on my last two nights, the 22nd and 23rd ; the wind dropped, the air was dry and fairly warm, and insects began to come to sugar. By the worn appearance of most of them, it was not lack of insects, but bad conditions, which had prevented them from coming before. The chief catch on the 22nd was *Leucania albipuncta*, in very fair condition, but by no means fresh ; whilst the 23rd was signalised by a pair of *Laphygma exigua*—one fair, one badly worn.

Caradrina ambigua was first taken on the 14th, and turned up in ones and twos, but never abundantly. The takes of the last two nights also included *Lobophora viretata* (netted), *Calymnia affinis*, *Noctua plecta*, *N. c-nigrum*, *Leucania putrescens*, *L. pallens*, *Agrotis puta*, *A. suffusa*, and many other common species ; whilst a somewhat startling visitor to the sugar was *Locusta viridissima*, of gigantic size. *Apamea oculea* occurred in bewildering variety, sometimes approaching the colouring of *Mamestra persicariæ*.

On the whole, but for *Leucania albipuncta* and *Laphygma exigua*, the results were disappointing. With regard to the latter insect, it did not turn up till just ten o'clock, and was found on a post which had been examined not ten minutes before ; the second was found fifteen minutes later at nearly the same spot. I believe that systematic netting while examining the sugar would produce more of this rare little insect ; but this requires a skilled companion, and is not always possible.

Day-work at Babbicombe does not seem very productive. Beyond *Bryophila muralis*, only a few poor specimens of *Larentia olivata* and one *Anticlea rubidata* are worth mentioning. *Cidaria picata*, said to be found on the Bishop's Walk, was beaten for in vain, and, although the second brood of *Acontia luctuosa* was carefully hunted for, not a single specimen was seen. Most of the walls swarmed with *Bryophila muralis*, and I confined myself to a single piece about twenty yards long, clean and newish

looking, on which the insects were very easily seen; on the best days ten or twelve were taken from this wall in as many minutes, and on the 18th I found five still on it at one p.m. in full sunshine. Some of the forms are olive-green—a form which seems peculiar to South Devon—whilst others approach the orange tint, for which Folkestone is famous. Altogether about fifty were taken, and it is possible to arrange them in an unbroken series from the colour of the typical *B. perla* to the dark olive-green. One fine large specimen was an exact reproduction in miniature of *Agriopsis aprilina*.

Two visits to Dawlish were made on the 12th and 21st respectively. On the 12th *Callimorpha hera* was just appearing, and ten specimens were taken—a few in perfect condition. The yellow form (*flavescens*) seems to have increased to nearly 40 per cent. of the captures, while the intermediate orange form is getting more numerous. It is possible to arrange a series graduated from crimson to yellow. On the 21st only four *hera* were taken, but it still seemed to be emerging; the ground was so thick with collectors that it was almost impossible at ten o'clock to find a hedge that had not already been beaten. On both days the hedges teemed with geometers, the best being *Zonosoma porata* and *Acidalia immitaria*. On the 21st a single specimen of *Colias edusa* was taken, so fresh that it had probably only just dried its wings. The afternoon was spent in the warren in search of *Mesotype virgata*; in spite of a strong east wind eleven were taken, but more than half were too worn to be of value.

Altogether seventy-seven different species were taken in three weeks, and many more could have been secured.

102, Warwick Street, Eccleston Square, S.W.

A CONTRIBUTION TOWARDS A REVISION OF THE BRITISH TORYMINA.

By P. CAMERON.

IN this paper I have only dealt with the species I have in my own collection, and mainly the species I have reared. It is really more a revision of the Scottish species; for, to prepare a thorough revision of the British species, it would be necessary to make a critical examination of the collection of the late Mr. Francis Walker, now in the British Museum. There is no British list with which a useful comparison can be made; but Thomson (Hymen. Scand. iv.) records fifty-nine species from Scandinavia, and Mayr, in his Monograph of the European species (Verh. z.-b. ges. Wien, xxiv.), describes seventy-eight

species. My work has been greatly facilitated, and the identity of the species placed beyond dispute, by the aid of a valuable series of types which I received from Prof. Gustav L. Mayr.

MONODONTOMERUS, *West.*

1. *M. obscurus*, *West.*

M. obscurus, Westwood, Phil. Mag. ii. 443; Mayr, Verh. z.-b. ges. Wien, xxiv. 68.

Callimone pubescens, Walker, Ent. Mag. i. 138.
New Forest.

2. *M. dentipes*, *Boh.*

Torymus dentipes, Boheman, Vet. Ac. Handl. 1833, 335.

Monodontomerus dentipes, Walker, Ent. Mag. ii. 158?;
Thomson, Hym. Scand. iv. 67.

One specimen from Mr. J. E. Fletcher taken on the windows of his house at Worcester.

DIOMORUS, *Walk.*

3. *Diomorus armatus*, *Boh.*

Torymus armatus, Boh. Vet. Ac. Handl. 1833, 336.

Diomorus nobilis, Walker, Ent. Mag. ii. 159; Thoms. Hym. Scand. iv. 72, 1.

One example; Clydesdale. Bramble-stems.

SYNTOMASPIS, *Foer.*

Syntomaspis, Foerster, Hym. Stud. ii. 43.

4. *Syntomaspis saphirina*, *Boh.*

Torymus saphirinus, Boheman, Vet. Ac. Handl. 1833, 371.

T. caudatus, Nees, Hym. Ich. Aff. Mon. ii. 60.

Callimone affinis, Walker, Ent. Mag. 1833, 133.

C. littoralis, Walker, *l.c.* 134.

Syntomaspis saphirina, Thomson, Hym. Scand. iv. 75, 3.

Common in galls of *Andricus terminalis*.

5. *Syntomaspis pubescens*, *Foer.*

Torymus pubescens, Foerster, Beitr. z. Mon. d. Ptero. p. xxx.

Two examples bred from galls of *Rhodites eglanteriæ*; Clydesdale. Not hitherto recorded as British.

6. *Syntomaspis fastuosa*, *Boh.*

Torymus fastuosa, Boheman, Vet. Ac. Handl. 1833, 347.

Callimone notatus, Walker, Ent. Mag. i. 134.

Syntomaspis fastuosa, Mayr, Verh. z.-b. ges. Wien, xxiv. 78;
Thoms. Hym. Sc. iv. 73.

Cladich, Loch Awe, June.

7. SYNTOMASPIS CYANEA, *Boh.*

Torymus cyaneus, Boheman, Vet. Ac. Handl. 1833, 366.

Callimone eurynotus, Walker, Ann. Mag. Nat. Hist. v. (2) 126.

Syntomaspis cyanea, Mayr, Verh. z.-b. ges. Wien, xxiv. 79;

Thoms. Hym. Sc. iv. 74.

Not uncommon in galls of *Dryophanta longiventris*.

OLIGOSTHENUS, *Foer.*8. OLIGOSTHENUS STIGMA, *Fab.*

Ex Bedeguar galls, Cheshire.

HOLASPIS, *Mayr.*

Holaspis, Mayr (*non* Gray), Verh. z.-b. ges. Wien, xxiv. 83.

9. HOLASPIS MILITARIS, *Boh.*

Torymus holaspis, Boheman, Vet. Ac. Handl. 1833, 338.

Holaspis militaris, Mayr, z.-b. ges. Wien, xxiv. 85; Thomson, Hym. Sc. iv. 70.

This genus has not been recorded from Britain before. I owe its record to Dr. T. A. Chapman, who sent me some galls of *Aulax rhæadis* from Hereford, from which the species was reared.

TORYMUS, *Dal.*

Torymus, Dalman, Vet. Ac. Handl. 1820, 135; Mayr, Verh. z.-b. ges. Wien, xxiv.

Callimone, Walker, Ent. Mag. i. 119.

Thomson (Hym. Sc. iv. 60) separates *Callimone* from *Torymus* through differences in the mandibles, the form of the metathorax and of the costal cellule, but these differences appear to me to merge so much into each other that I can hardly look upon them as of generic value. Thomson's *Callimone* represents the Section A of Mayr's Monograph.

10. TORYMUS ERUCARUM, *Schr.*

Ichneumon erucarum, Schrank, Enum. Ins. Austr.

Torymus fulgidus, Boheman, Vet. Ac. Handl. 1833, 345.

Callimone cynipedis, Walker, Ent. Mag. i. 119.

Torymus erucarum, Mayr, Verh. z.-b. ges. Wien, xxiv. 87;

Thoms. Hym. Sc. iv. 86, 11.

Parton, Loch Ken, Clydesdale. Rare.

A parasite of *Aphilothrix radicis*.

11. TORYMUS FULGENS, *Fab.*

Ichneumon fulgens, Fabr. Ent. Syst. Supp. 230.

Torymus fulgens, Nees, Hym. Ichn. Aff. Mon. ii. 61; Mayr, Verh. z.-b. ges. Wien, xxiv. 88.

Callimone rosaces, Walker, Ann. Mag. Nat. Hist. xxii. 88.

Rare. Clober, near Glasgow.

12. *TORYMUS CHRYSOCEPHALUS*, Boh.

Torymus chrysocephalus, Boheman, Vet. Ac. Handl. 1833, 340; Mayr, Verh. z.-b. ges. Wien, xxiv. 89.
Callimone rudis, Walker, Ent. Mag. iv. 25.
 Rare. Bishopton.

13. *TORYMUS ABDOMINALIS*, Boh.

Torymus abdominalis, Boheman, Vet. Ac. Handl. 1833, 343; Mayr, Verh. z.-b. ges. Wien, xxiv. 9.
Callimone angelicæ, Walker, Ent. Mag. iv. 25.
 Common in galls of *Biorhiza terminalis*, *Aphilothrix curvator*, *Spathogaster baccarum*, *Dryophanta divisa*.

14. *TORYMUS NOBILIS*, Boh.

Torymus nobilis, Boheman, Vet. Ac. Handl. 1833, 339; Mayr, Verh. z.-b. ges. Wien, xxiv. 92.
Callimone roboris, Walker, Ent. Mag. i. 120.
C. regalis, Walker, l.c. 119.
C. subterraneus, Curtis, Brit. Ent. xii. t. 552.
 Gloucester; London districts. Galls of *Aphilothrix radiceis*, *A. sieboldi* and *Biorhiza aptera*, all root galls.

15. *TORYMUS VENTRALIS*, Fonsc.

Cynips ventralis, Fonsc, Ann. Soc. Nat. xxvi. 286.
Callimone quadricolor, Walker, Ent. Mag. i. 120.
Torymus ventralis, Mayr, Verh. z.-b. ges. Wien, xxiv. 93.
T. affinis, Foerster, Beitr. z. Mon. d. Ptero. xxix.
 Eccles, Dumfriesshire. Rare.

16. *TORYMUS REGIUS*, Nees.

Torymus regius, Nees, Hym. Ichn. Aff. Mon. 1834, 55; Mayr, Verh. z.-b. ges. Wien, xxiv. 95.
T. nigricornis, Boheman, Vet. Ac. Handl. 1833, 355.
Callimone inconstans, Walker, Ent. Mag. ii. 159.
C. lateralis, Walker, l.c. 159.
C. devoniensis, Parfitt, Zool. 1856, 5074.
 Common. Galls of *Cynips kollari*, *Biorhiza terminalis*, *Dryophanta folii*, *Spathogaster baccarum*.

17. *TORYMUS AZUREUS*, Boh.

Torymus azureus, Boheman, Vet. Ac. Handl. 1833, 369; Mayr, Verh. z.-b. ges. Wien, xxiv. 100; Thomson, Hym. Scand. iv. 84.
 Perth; from fir-cones inhabited by *Eupithecia togata*.

18. *TORYMUS CAUDATUS*, Boh.

Torymus caudatus, Boheman, Vet. Ac. Handl. 1833, 365; Thomson, Hym. Scand. iv. 84.

A Scotch example without note of locality. Worcester; from cones of *Abies* (J. E. Fletcher).

Mayr unites *T. azureus* and *T. caudatus*, but Thomson regards them as extinct species. My examples appear to show a variation in the length of the ovipositor compared to the length of the body.

19. TORYMUS BEDEGUARIS, L.

Ichneumon bedeguaris, Linné, Syst. Nat. ii. 939.

Torymus försteri, Ratzburg, Ichn. d. Forstins, i. 1844, 178.

T. bedeguaris, Mayr, Verh. z.-b. ges. Wien, xxiv. 101; Thomson, Hym. Scand. iv. 87.

Rare in the "bedeguar" galls of *Rhodites rosæ*. Thomson, l. c., regards *T. druparum*, Boh. sec. Mayr, bred from the fruit of *Prunus scandica*; and *T. elegans*, Boh. sec. Mayr = *varians*, Walker, Ent. Mag. i. 122.

T. varians, Walker, I am inclined, if I have correctly identified my specimens, to regard as a good species, and probably, as Mayr suggests, identical with *T. elegans*, Boh. It seems the more likely of *T. varians* being distinct from the bedeguar species from its different habits, it being a parasite on willow *Cecidomyiæ*.

20. TORYMUS VALLISNIERII, sp. nov.

Viridis, abdomine supra cupreo, subtus testaceo; alis hyalinis; pedibus flavo-testaceis, tibiis posticis infuscatis.

Long. fere 2; terebra 2 mm.

Clydesdale; ex galls of *Nematus gallicola*, West. (*vallisnierii*, Htg.).

Scape of antennæ testaceous beneath; the flagellum shining, metallic purple, variegated with green; the third and fourth joints equal in length. Head dark purple, slightly variegated with green, shining, very minutely punctured. Thorax green, strongly and closely punctured, closely covered with a microscopic fuscous pubescence; the median segment almost impunctate, shining, bare, more purplish in tint than the mesonotum. Pleuræ green, closely punctured. Legs pallid yellow, the coxæ green, except at the apex, strongly punctured; the hinder femora in the middle distinctly, the hinder tibiæ slightly infuscated; the apex of the hinder tarsi infuscated; the longer spur of the hinder tibiæ scarcely one-fourth of the length of the metatarsus. Wings clear hyaline; the nervures yellow. Abdomen dark purple, except the basal segment, which is green, and the sides at the apex which are slightly tinted with green; the ventral surface at the base broadly testaceous; the rest green suffused with bronzy tints.

Comes nearest to *T. abbreviatus*, but that is a larger and stouter species, has the ovipositor longer, the thorax and abdomen much more bronzy and shining, the ventral surface not

testaceous, the legs are of a brighter colour, and the antennæ are not shining metallic.

No species of *Torymus* has been recorded from the galls of *Nematus gallicola*; but two species of *Eulophus* and one *Pteromalus* have been reared.

21. *TORYMUS IGNICEPS*, Mayr.

Verh. z.-b. ges. Wien, xxiv. 103.

I have a specimen from Clober Wood, which agrees with Mayr's description, as well as an English example, differing, however, somewhat from it.

22. *TORYMUS ABBREVIATUS*, Boh.

Torymus abbreviatus, Boheman, Vet. Ac. Handl. 1833, 357;

Mayr, Verh. z.-b. ges. Wien, xxiv. 105, 20.

T. euchlorus, Boh. l.c. 359.

Callimone chloromerus, Walker, Ent. Mag. i. 128.

C. æqualis, Walker, l.c. 129.

Torymus chlorinus, Foerster, Beitr. z. Mon. d. Pter. xxx.

Rare. Cadder Wilderness; in galls of *Cecidomyia rosæ*. It is a variable species.

23. *TORYMUS FUSCIPES*, Boh.

Torymus fuscipes, Boheman, Vet. Ac. Handl. 1833, 374;

Mayr, Verh. z.-b. ges. Wien, xxiv. 108.

Two Clydesdale examples identical with a type from Mayr.

Mayr considers *T. chlorocopes*, Boh., as identical with *T. fuscipes*; but Thomson (Hym. Scand. iv. 85) considers the two to be distinct. With the material at my command I am unable to give an opinion.

24. *TORYMUS JUNIPERI*, L.

Ichneumon juniperi, Linné, Fauna Suec. 408, 1635.

Diplolepis juniperi, Fab. Syst. Piez. 1804, 150.

Torymus amethystinus, Boheman, Vet. Ac. Handl. 370, 1833 ?; Thomson, Hym. Sc. iv. 85.

Common in galls of *Hormomyia juniperina*, L. Clober Moor, Dumbartonshire.

25. *TORYMUS HIBERNANS*, Mayr.

Verh. z.-b. ges. Wien, xxiv. 111, 26.

Rare. Clober; in galls of *Neuroterus lenticularis*, in which they are laid in the autumn.

26. *TORYMUS TIPULARIARUM*, Zett.

Torymus tipulariarum, Zetterstedt, Ins. Lappon. 420; Mayr, Verh. z.-b. ges. Wien, xxiv. 111.

T. pumilus, Ratzburg, Ichn. d. Forstins. i. 180.

In the "rose" galls of *Cecidomyia salicis*.

27. *TORYMUS MACROPTERUS*, Walker.

Callimone macroptera, Walker, Ent. Mag. i. 124.

Torymus purpurascens, Nees, Hym. Ich. Aff. Mon. ii. 517.

T. macropterus, Mayr, Verh. z.-b. ges. Wien, xxiv. 114, 31.

Galls of *Rhodites spinosissima*; Troon, Arran; sand-hills at New Brighton. In galls of *Diastrophus rubi*; Worcester (J. E. Fletcher).

28. *TORYMUS AURATUS*, Fons.

Cynips aurata, Fons. Ann. Sc. Nat. xxvi. 284.

Torymus viridissimus, Boheman, Vet. Ac. Handl. 1833, 358.

Callimone autumnalis and *C. confinis*, Walker, Ent. Mag. i. 125.

C. mutabilis, Walker, l.c. 127.

C. leptocerus, Walker, l.c. 129.

C. minutus, Walker, l.c. 137.

Torymus muscarum, Nees, Hym. Ich. Aff. Mon. ii. 58.

T. propinquus, Foerster, Beitr. z. Mon. d. Pter. xxx.; Ratzburg, Ich. d. Forstins, iii. 223.

T. appropinquans, Ratzburg, l.c. 179.

T. auratus, Mayr, Verh. z.-b. ges. Wien, xxiv. 115.

T. viridissimus, Thomson, Hym. Scand. iv. 90, 18.

Common in many oak galls:—*Biorhiza terminalis*, *Andricus inflator*, *A. curator*, *A. cirratus*, *A. ramuli*, *A. 4-lineatus*, *Spathogaster baccarum*, &c.

29. *TORYMUS AMÆNUS*, Boh.

Torymus amœnus, Boheman, Vet. Ac. Handl. 1833, 348; Mayr, Verh. z.-b. ges. Wien, xxiv. 117; Thomson, Hym. Sc. iv. 89, 15.

Callimone formosus, Walker, Ent. Mag. i. 122.

C. scutellaris, Walker, l.c. 123.

Torymus compressus, Foerster, Beitr. z. Mon. d. Pter. 1841, xxx.

Rare. In galls of *Aphilothrix radialis* and *Trigonaspis megaptera*. Clydesdale and Loch Awe.

30. *TORYMUS SODALIS*, Mayr.

Torymus sodalis, Mayr, Verh. z.-b. ges. Wien, xxiv. 120.

Not common. Clober; in galls of *Neuroterus lenticularis*.

31. *TORYMUS DAUCI*, Curt.

Callimone dauci, Curt. Brit. Ent. xii. 552.

Torymus dauci, Mayr, Verh. z.-b. ges. Wien, xxiv. 118.

New Forest. A parasite in *Cecidomyiæ* on *Pimpinella* and *Daucus*.

32. *TORYMUS GALII*, Boh.

Torymus galii, Boheman, Vet. Ac. Handl. 1833, 344; Mayr, Verh. z.-b. ges. Wien, xxiv. 121; Thomson, Hym. Scand. iv. 97, 31.

T. gracilis, Walker, Ent. Mag. i. 137.

Not common. Clydesdale; in galls of *Cecidomyia galii*, Winn.

33. *TORYMUS CAMPANULÆ*, Cam.

Torymus campanulæ, Cameron, Ent. Mon. Mag. 1880, 40.
Rare in galls of *Cecidomyia campanulæ*; Clydesdale.

34. *TORYMUS VIRIDIS*, Foer.

Torymus viridis, Foerster, Beitr. z. Mon. d. Ptero. p. xxx.
Rare. Clydesdale; in galls of *Rhodites eglanteriæ*.

35. *TORYMUS PRUNI*, Cam.

Torymus pruni, Cam. Trans. Ent. Soc. 1883, 196.
Milngavie; in galls of *Cecidomyia pruni*, Kalt.

VARIATION IN THE GENUS *EREBIA*.

By GEOFFREY SMITH.

PART I.

DURING this and previous years I have collected this genus in the English Lake district, and in Savoy, with the purpose, shared by so many collectors, of studying its variability, and the problems connected therewith. The work of Dr. Chapman (Trans. Ent. Soc. 1898), who has based a means of identifying the different species by means of the gonapophyses of the male, has cleared the way for such studies, and is, I believe, absolutely reliable. It is a well-known fact that the various species of *Erebia* are extremely variable in their wing-facies; even when whole groups have been separated as persistent varieties from a type-species on the characters of their gonapophyses, &c., the various sub-groups or varieties are not at all homogeneous. There is great individual variability.

Side by side with this fact I should like to mention another fact even more striking, and that is the great preponderance of males over females in the majority of species. These two facts seem to me to be the leading facts with regard to the genus, and from habitually considering them together I have been led to suppose that there might be some causal connection between them. In trying to establish a causal connection between these two facts, it was necessary to treat the subject from a more or less statistical point of view; I have therefore used the means explained in Prof. Galton's 'Natural Inheritance' for drawing out a scheme of distribution of characters. The application of this scheme will become obvious during the course of this essay.

I have selected for the purpose in hand *Erebia epiphron* var. *cassiope*. This variety, in the regions in which I have studied it,

does not mix at all with the type-species, as the latter is entirely absent. The males are extremely variable in the character of their facies; the females, on the other hand, are practically constant, and in the proportion of about five to one hundred males. (This question of numerical disproportion of sexes will be treated of hereafter.) Although I have selected this variety as a concrete example on which to fix theoretical considerations, the general conclusions will apply to other species and varieties of this and other genera where the facts are similar.

The males of *E. epiphron* var. *cassiope* are widely variable in their wing-facies, but I want to fix on some variable character that can be treated numerically. Obviously the black spots on the rusty-brown patches will serve; they are extremely variable in number in the males, and, I believe, constant in the females. The constant number for the females will be taken as nine (it is really about seven), counting those on fore and hind wing. In Table I. is given a list showing an imaginary percentage of distribution of the spots among the males. An imaginary percentage is chosen for the sake of simplifying the numbers; it does not interfere with general conclusions.

TABLE I.

| Sums from beginning. | Cases observed. | No. of spots. |
|----------------------|------------------|---------------|
| 10 | 10 per cent. had | 0 |
| 20 | 10 " " | 1 |
| 25 | 5 " " | 2 |
| 30 | 5 " " | 3 |
| 40 | 10 " " | 4 |
| 55 | 15 " " | 5 |
| 65 | 10 " " | 6 |
| 75 | 10 " " | 7 |
| 80 | 5 " " | 8 |
| 100 | 20 " " | 9 |

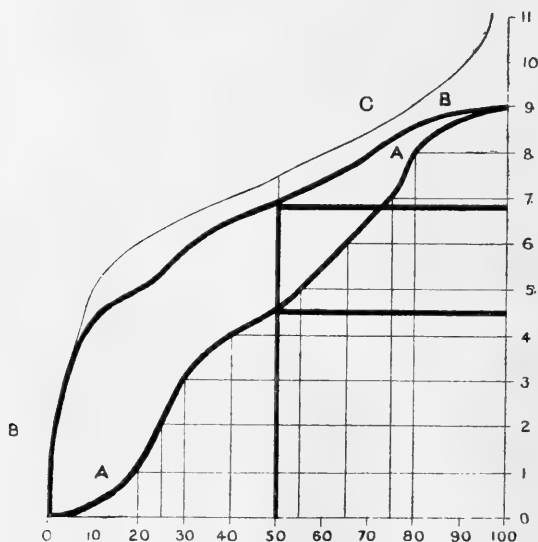
The contention is that if there were equal numbers of males and females—*i.e.* if all the individual males of Table I., with their various numbers of spots, could pair with a corresponding number of females with their constant number of spots (nine)—then the whole species would tend to return to the original stable condition of nine spots for males and females alike; but since only a small minority of the males can pair, the species is kept in a state of fluctuation.

It is necessary to make one preliminary hypothesis—that male and female in inheritance each transmit half their characteristics, and that this applies to the number of black spots. This ignores heritages from remote ancestors, but I have chosen $\frac{1}{2}$ as preserving the proportion between the two sexes, and not complicating the figures. Now, it might be argued from the

hypothesis, that if a male with four spots paired with a female with nine, the offspring would have $(\frac{1}{2} \times 4) + (\frac{1}{2} \times 9) = 6\frac{1}{2}$ spots each; but this is not intended, as it is contrary to observation, and also to theory, since, if the different aberrant individuals bred true, they would constitute varieties, and this is not the case. What the hypothesis does maintain is that $6\frac{1}{2}$ spots represent the average number of spots distributed more or less unequally among the offspring, *i.e.* it is the "spot-power" transmitted to the offspring. This may appear fanciful, but it must be remembered that it is symbolical of an established probability, and also that we are dealing with only one factor in heredity.

Now, I want to find the mean "spot-power" of all the individuals mentioned in Table I. This I do by drawing a Scheme of Distribution, utilizing for this purpose the columns 1 and 3 in Table I. By this means curve A of fig. I. is obtained.

FIG. I.



Note.—The lines for construction of curve B have been rubbed out, but they may be filled in again according to the explanation in the note at the end.

Curve A gives $4\frac{1}{2}$ as the mean "spot-power."

Now, I want to find out what would be the mean "spot-power" of the next generation if all the individuals of Table I. paired and produced offspring. The same percentages may be taken, as it is supposed that each pair produced an equal number of offspring; the only difference between the values in column 3,

Table I., and in column 6, Table II., is that the former represent numbers observed, and the latter represent averages of numbers calculated. Now, halving the values for each sex, we derive the following numbers from Table I. :—

TABLE II.

| Sums from beginning. | Cases observed. | Spots observed. | ♂ heritage. | ♀ heritage. | Spots calculated for next generation of males, females ignored.* |
|----------------------|-------------------|-----------------|------------------|----------------------|--|
| 10 | 10 per cent. | 0 | 0 + | $4\frac{1}{2}$ | $4\frac{1}{2}$ |
| 20 | 10 „ | 1 | $\frac{1}{2}$ + | $4\frac{1}{2}$ | 5 |
| 25 | 5 „ | 2 | 1 + | $4\frac{1}{2}$ | $5\frac{1}{2}$ |
| 30 | 5 „ | 3 | $1\frac{1}{2}$ + | $4\frac{1}{2}$ | 6 |
| 40 | 10 „ | 4 | 2 + | $4\frac{1}{2}$ | $6\frac{1}{2}$ |
| 55 | 15 „ | 5 | $2\frac{1}{2}$ + | $4\frac{1}{2}$ | 7 |
| 65 | 10 „ | 6 | 3 + | $4\frac{1}{2}$ | $7\frac{1}{2}$ |
| 75 | 10 „ | 7 | $3\frac{1}{2}$ + | $4\frac{1}{2}$ | 8 |
| 80 | 5 „ | 8 | 4 + | $4\frac{1}{2}$ | $8\frac{1}{2}$ |
| 100 | 20 „ | 9 | $4\frac{1}{2}$ + | $4\frac{1}{2}$ | 9 |

The mean must now be calculated from columns 1 and 6 in Table II. The curve is shown in fig. I., curve B. The mean is about 7.

If we compare the two means $4\frac{1}{2}$ and 7, we see that on the condition of every individual pairing an approach is made to the typical number of the species (namely, 9), by raising the mean every generation. It need hardly be remarked that a generation with a mean “spot-power” of 7 is likely to produce more individuals with the typical 9 spots than a generation with a mean “spot-power” of $4\frac{1}{2}$, and so on in ascending order. In this way, then, everything else being equal, the stability of the species would be regained to a very great degree after a few generations.

Now it is obvious that, if not only every individual in the tables does not pair, but, on the contrary, only a very small minority can ever possibly hope to, the whole equilibrium of the system is thrown out of order. A few individuals with various numbers of spots will succeed by chance in pairing with the few females that exist; these will then establish their “spot-powers” for the next generation, which will be overthrown in the next for one also established by chance, and not in any regularly ascending scale.

To show that this state of things would not lead to an equilibrium, we must follow the subject rather more closely. Let us suppose that the mean power 7 has been acquired by a generation in the way described, and that then the majority of the females has been destroyed before the possibility of pairing.

* Reasons for ignoring females will be given later. At present, regularity of increase is to be noted.

Now only a few of the males can leave offspring. Let us say, for the sake of simplicity, that only one male with a high power, 8, succeeds in pairing. The offspring of the union of that male with a female of the ordinary power 9 will have a power of $8\frac{1}{2}$. Now, among these offspring—say, 100 in number—any of the powers from 0 to 9 may occur in as many combinations as is possible without altering the average power $8\frac{1}{2}$. Of these offspring only one again can pair, of which we will take, for the sake of argument, one with a power of 2. In the next generation, then, the power will be reduced to $(\frac{1}{2} \times 2) + (\frac{1}{2} \times 9) = 5\frac{1}{2}$; so that the high value of the previous generation will have been wasted, and to no purpose. By this simple example it is shown how a continuous state of fluctuation would be preserved between the various possible powers owing to the scarcity of females.

In this way I believe that the two phenomena conspicuously exhibited by the genus *Erebia*—namely, great variability and scarcity of females compared to males—may be brought into causal connection. I have neglected numerous factors, such as reversion, continuous action of changed conditions, variability of the female; I have also treated the spots on the wings as definite or particulate inheritable entities, which may well strike terror into the heart of the entomologist; but this has been done more as illustrative of a process than as an actual statement of one.

How far the principle here numerically illustrated may be a general one, I neither know myself, nor have found stated in a book; but I hope to work some results out from *Erebia* material in this essay. The principle itself may be enunciated broadly as follows: that equality in the relative number of the sexes tends towards the stability of a species, and that a preponderance of one sex tends towards fluctuations of character, even though the actual tendency to vary remains the same.

In the case considered the female was not a variable quantity, but in other cases the variability of the female will have to be taken into account, which will alter the problem somewhat, as a mean value will have to be substituted for the constant $4\frac{1}{2}$ in our tables. This does not apply, however, to the particular example under consideration, which has been taken to give simple numerical expression to a rule which probably acts in nature extremely complexly, and which will be considered in different aspects later on.

EXPLANATION OF FIG. I.—The percentages in columns 1 of Table I. and 1 of Table II. are recorded on the graduated lower line. The number of spots in columns 3 of Table I. and 6 of Table II. determine the height of the vertical lines to be erected at the corresponding grades on the lower line. The points of intersection of the vertical and perpendicular lines are joined by a curve. To find the mean a perpendicular is drawn from grade 50 to meet the curve, and from

the point where this line meets the curve a vertical line is drawn to the scale recording the number of spots. The point where the line meets the scale is the mean (M). This mean, so calculated, has several properties: when the curve is symmetrically disposed on either side of it, it is equal to the arithmetical mean, and this is the case with the curves given here, so that the figures $4\frac{1}{2}$ and 7 might have been obtained by the ordinary method of averaging; but I determined to throw the figures into the form of a scheme, as this method will be of advantage later on. Although curves A and B are normal with respect to their M, they are not normal in general slope. Curve C is an example of a curve normal in slope and in all respects. The bearing of these different kinds of curves on the subject will be seen in the sequel.

(To be continued.)

ACHERONTIA ATROPOS AND SPHINX CONVULVULI IN THE HARWICH DISTRICT.

By Fleet Paymaster GERVASE F. MATHEW, R.N., F.L.S., F.E.S.

ON August 14th a labourer brought me a fine larva of *A. atropos* and said that he found it under a bush while he was looking for mushrooms. This I doubted, but it showed me that the larvæ were already full grown, and as I wanted to breed a few to renew my old series, I paid a visit the following afternoon to a potato-field not far from my house, and, after a couple of hours' search, succeeded in finding seven, nearly all full grown. They were magnificent creatures, all bright golden green with the usual oblique blue stripes and dots. They were not difficult to find, for by walking slowly between the rows of potatoes one could see where the larvæ had been feeding, as the haulms in many instances were nearly stripped, and if the larva had not buried it was usually to be found upon the under side of one of the lower leaves. I found many plants so eaten by larvæ that had already gone down, which shows that they have been numerous and early this season. Where the plants were not of luxurious growth the larva was easy to see some distance off, and one fine fellow I detected nearly a hundred yards away, as it rested on a bare stem, where it looked very conspicuous in the rays of the setting sun.

My children were very much excited at my capture of these huge caterpillars, and the next morning, the 16th, four of them set out at 6 o'clock to look for more. When they came home to breakfast they said they had found three, but that they were smaller than mine, and two of them were green, and the third nearly black, and their horns were smooth; so, after breakfast, I went out into the garden to have a look at them, and directly I saw the first, which they took out of the large breeding-cage in

which they had been placed, I exclaimed, "Why, bless me, this is a *convolvuli*, not a death's-head!" and then one of the children remarked, "I expect the others are the same," and so the next one was; but the third—the dark one—was not forthcoming, having escaped through a hole in the muslin wall of the cage while we were at breakfast, and although a diligent search was made it could not be found.

Of course I was very much pleased at the sight of a British example of the larva of *convolvuli*, never having met with it before in this country, though I have frequently taken it on the Continent. My children told me that they found one on the ground between the rows of potatoes, one on a potato haulm, and the third fell off as they were walking among the plants. I may as well mention that this field is situated on the slope of a hill, that the soil is of a light and sandy nature, and the ground very foul, the potatoes being almost choked in places with masses of small bindweed (*C. arvensis*), chenopodium, knot-grass, &c. After this grand discovery I was anxious to try and find one of these larvæ myself, so I went off to the field at once and hunted till lunch time, the result being the capture of one *convolvuli* larva (the brown variety, as figured in Buckler's 'Larvæ of British Butterflies and Moths,' vol. ii., plates 21 and 22) and six more larvæ of *atropos*; but I found traces in several places where other larvæ of *convolvuli* had been feeding, and by the size of the frass had most likely already buried. The frass of *convolvuli* is rather elongated, and smaller at one end than at the other, whereas that of *atropos* is square, or brick-shaped; moreover, the frass of the latter lies in a mass under the plant upon which the larva has been feeding, while that of the former is found at intervals upon the ground, and by this means the larva can be traced.

On the morning of the 17th I went to another potato-field, more than a mile away from the first one, and worked from 10 until 1 p.m., finding one more *convolvuli* and five more *atropos*. In this field the haulms were of most luxuriant growth, being quite knee-deep, and the ground had been more carefully farmed, so that, with the exception of one corner, there was very little bindweed to be seen. This condition of things made it more difficult to see the larvæ, and the *atropos* I almost walked against before I noticed them. The *convolvuli* I found just as I was leaving the field. It was a small one about half grown, and was high up upon a potato haulm, up which some of the bindweed was creeping.

On Monday morning, the 19th, I received a small box by post from a coast-guard man stationed at Cornhill, near Dover, with a note to say that he thought the caterpillar enclosed "is the D. H. moth," but when I opened the box I found it contained a fine and nearly full-grown larva of *convolvuli*, which had been

packed with cabbage and potato-leaves, and so was in rather a famished condition, as it had been travelling since Saturday the 17th. It began to feed ravenously at once, and in a few days was full grown, and had attained to dimensions nearly as large as my largest *atropos*. This was a green larva, and as far as my experience goes green is the typical colour.

This is both a *convulvuli* and *atropos* year, for between the 19th ultimo and the date of this paper I have taken or had brought to me eight more larvæ of the former and more than twenty of the latter, besides having seen *convulvuli* flying at late honeysuckle in my garden, and having had several of the moths brought to me. I have also noticed traces of the larvæ of both species in every potato-field I have visited in this neighbourhood, and the larvæ of *atropos* have occurred in every little patch of potatoes in the cottage and allotment gardens around Harwich and Dovercourt.

As we have no weekly paper, and in order that my brother entomologists might know that these larvæ were about, I wrote to several of the daily papers to inform them, so that they might be on the look-out for them before it was too late. The result of this was that I was overwhelmed with applications from all sorts of people, asking me to send them larvæ, pupæ, or the perfect insects of each species. I also received several letters from gentlemen on the occurrence of *convulvuli*, from which I learn that it has been taken near Bridport, Manor Park, and Rye, and that it has been numerous in Jersey.

In the above remarks I have stated that I believe the green to be the typical form of *convulvuli*, so perhaps it will be as well to give a short description of the larva.

(A.) Typical form. Bright apple-green, with narrow black lines between the skin folds; oblique stripes bright yellowish green; head green, with black stripes each side of the cheeks; horn orange-red, tipped with black.

(B.) Var. 1.—As above, but with a subdorsal row of square-shaped black spots, and a large black blotch above each spiracle.

Var. 2.—Apple-green, with the oblique stripes broadly bordered above by purplish black, the stripes nearly meeting over the back, and those on the last two segments running up to the base of the caudal horn.

Var. 3.—The brown variety, as figured by Buckler, but difficult to describe.

It is a hard-feeling larva to the touch, and when annoyed curls itself into a ring, or violently jerks itself from side to side.

Dovercourt, Essex: Sept. 10th, 1901.

DESCRIPTIONS OF FOUR NEW SPECIES OF NOCTUIDÆ
FROM THE TRANSVAAL.

By W. L. DISTANT.

THE moths here described will be figured in my 'Insecta Transvaaliensia,' and I have to thank Sir G. F. Hampson for his assistance in rendering their generic localisation in unison with his revision of the family.

Proruaca harmonica, sp. n.

Head and pronotum griseous brown, the eyes and anterior margin of the pronotum distinctly darker; abdomen greyish white, its apex fuscous; sternum ochreous white, the legs dark brownish, more or less mottled with greyish white, especially the tibiæ and tarsi. Anterior wings griseous brown, crossed at about one-third from base with an inwardly oblique and outwardly much angulated dark fascia, and with a similarly coloured but wider fascia commencing near outer angle, and at about one-third from its base bifurcating, the outer branch reaching costal margin near apex, the inner branch inwardly curved and reaching costal margin near the apex of the subbasal fascia, the outer margin of the bifurcated fascia being somewhat broadly dark purplish brown, with two prominent spinous angulations; posterior wings creamy white, the apices of the veins and a submarginal line palely fuscous. Both wings beneath creamy white, anterior wings with the apex dusted with fuscous, and with a marginal series of pale fuscous spots; posterior wings marked as above. Exp. wings, 40 millim.

Hab. Pretoria.

Xanthoptera carcaroda, sp. n.

Head, pronotum, and anterior wings dark chocolate-brown; abdomen, body beneath, legs, and posterior wings very pale fuscous; legs speckled and spotted with brown. Anterior wings with obscure darker lineate spots, and with an apical marginal series of castaneous short lanceolate fasciæ, the outer marginal fringe alternately marked with greyish; posterior wings with the fringe greyish. Long. 32 millim.

Hab. Lydenburg district.

Eutelia callichroma, sp. n.

Body above pale ochraceous, a macular central transverse fascia, and a subbasal spot to pronotum, two inwardly bent central discal fascia to abdomen united posteriorly and containing three intermediate spots dark brownish ochraceous; body beneath and legs pale ochraceous, the tibiæ and tarsi mottled with greyish white. Anterior wings ochraceous, mottled with brownish ochraceous, with two short oblique purplish brown fasciæ, the first at about one-third from base inwardly directed from beneath discoidal cell to inner margin, the second at about one-third from apex outwardly directed from costal margin to less than one-half across apical area, the inner fascia preceded and the outer fascia followed by a pale castaneous spot margined with ochreous

white; the inner fascia is also broadly outer margined with ochreous white, and is succeeded above by a large patch of plumbageous freckles; a subapical transverse dark fascia inwardly much angulated, and margined with ochreous white; posterior wings ochreous white, with two outer submarginal dark brown fasciæ, the outermost not reaching inner angle. Wings beneath paler, markings more or less obsolete, a distinct discoidal spot to posterior wings. Exp. wings, 28 millim.

Hab. Lydenburg district.

Plusia arachnoides, sp. n.

Head and pronotum dark brownish ochraceous, with transverse narrow greyish fasciæ, abdomen and body beneath very pale brownish ochraceous, legs brown, speckled with creamy white. Anterior wings obscure castaneous, the veins greyish, and with the following greyish linear fasciæ: two inwardly oblique about one-fourth from base, extending from beneath discoidal cell to near base of inner margin, two outwardly oblique crossing wing near centre of discoidal cell, and a duplex series of two, inwardly curved near apex, scarcely crossing wing half-way; posterior wings ochraceous, very broadly outwardly fuscous, fringe greyish white; anterior wings beneath brownish ochraceous, posterior wings generally as above. Exp. wings, 32 millim.

Hab. Pretoria.

NOTES ON THE DIVISION VELIARIA [RHYNCHOTA]
(=SUBFAM. VELIDÆ, LETH. & SEV.).

By G. W. KIRKALDY, F.E.S.

THIS division is in hopeless generic confusion at present, and a revision is impossible without an inspection of all the types. The tarsi of the intermediate and posterior legs are nearly always more or less distinctly trisegmentate, but as a rule the anterior tarsi are only, apparently, composed of a single segment; close inspection shows the presence of one or two other segments, but whether these are real sclerites or merely "nodes," like those found between certain of the antennal segments in—*e.g.*—*Gerris*, is contested. Accordingly, then, as authors have considered them as segments, or nodes (or have overlooked them altogether), have they described the anterior tarsi as 1-, 2-, or 3-segmentate. Thus *Neovelis*, F. B. White, and *Trochopus*, Carpenter, are probably not generically distinct from *Rhagovelis*, Mayr; *Velimorpha*, Carlini, is also probably identical with *Microvelis*, Westw.; it is doubtful, too, if *Paravelis*, Breddin, can be regarded as distinct from *Velis*, Latr. *Perittopus*, Fieber, described from India (generically only) in a work on European bugs, is now described in full for the first time after a lapse of forty years. The other genera included in Lethierry and Severin's Catalogue are unknown to me except by description.

The *Veliaria* are readily distinguished by the form of the sterna, which are subequal in length among themselves, by the short stout antennæ, the short, often stout, legs, &c. They are lacustrine, or fluvialile, except a few estuarine species of *Rhagovelia*.

PERITTOPUS, *Fieber*.

1861, Europ. Hemiptera, p. 33.

Apterous form: suboval; rostrum short, antennæ short, stout. Pronotum narrowly collared in front. Anterior tarsi apparently unisegmentate (two minute basal nodes or segments), intermediate and posterior tarsi distinctly trisegmentate. Claws inserted posterior to the apex, in a slight cleft. Connexiva well developed, broad. Type, *P. breddini*, Kirk.

P. BREDDINI, sp. nov.

=? *P. rufus*, Fieber, *l.c.* (inedit.).

Ocelli large and distinct, a little nearer to the eyes than to one another or to the base of the head. First three segments of antennæ subequal in length, fourth about one-fifth longer than third, fusiform. Rostrum reaching to middle of the broadly sulcate mesosternum. Pronotum coarsely punctured, subconstricted laterally (*forma aptera*) at a little more than a third of its length, and tuberculo-elevate posterior to the constriction; subangulate-rotundate posteriorly. Femora not or scarcely incrassate. Segments of intermediate tarsi almost subequal (8 : 9 : 10). First segment of posterior tarsi very short, third slightly longer than second.

Sanguinescent; antennæ and legs black; anterior femora (except apex), base of intermediate and posterior femora, pallid fulvous; fourth segment of rostrum black. Eyes greyish black; ocelli rubid. Centre of pronotum blackish. Abdomen black; connexivum, segments six and seven, and genital segments pale sanguineous brownish. Ventral surface fulvous; legs, &c., paler.

♀. Apical margin of seventh segment above, truncate.

Long. 4 mill.; lat. $1\frac{3}{5}$ mill.

Hab. EAST JAVA, Tengger Mts. (coll. Breddin).

We owe the rediscovery of this handsome little species to the exertions of Mr. Fruhstorfer.

RHAGOVELIA.

Rhagovelia, Mayr, 1865, Verh. Zool.-bot. Ges. Wien, p. 445; Champion, 1898, Biol. Centr.-Amer. Rhynchota II. p. 133; Kirkaldy, 1899, Boll. Mus. Torino, xiv. No. 350, p. 4, and 1900, 'Entomologist,' p. 71 (type, *nigricans* (Burm.)).

Bæcula, Stål, 1866, Hem. Afric. iii. p. 167.

Neovelis, F. B. White, 1879, Journ. Linn. Soc. Lond. xiv. p. 487 (type, *trilii*, White).

Trochopus, Carpenter, 1898, Ent. Mo. Mag. xxxiv. p. 78 (type [*marinus*, Carp. =], *plumbea*, Uhl.).

(To be continued.)

NOTES AND OBSERVATIONS.

A FEW NOTES ON REARING COSSUS LIGNIPERDA. — Having been repeatedly told that it was difficult to rear this species, I determined to try for myself, and in September, 1900, collected a dozen larvæ from tree-trunks in this district. I placed them in a glass jar with some pieces of an oak-branch, covering the top with a piece of glass, and a weight to keep the larvæ from forcing their way out. They fed readily, and, spinning together the particles of gnawed wood and grass, converted the whole into a nearly solid elastic mass, in which they seemed very contented. Thus they remained until the beginning of February, 1901, when the jar was accidentally broken, and I transferred the larvæ to a tin biscuit-box in company with some pieces of poplar-bark. A few holes punched in the lid gave ventilation, and I did not open the tin again until June 20th. On that date, having occasion to visit the outhouse in which I had placed them, I took off the lid to see how the larvæ had fared, and found that, of my twelve larvæ, one (probably injured when the glass jar was broken) was dead, one was still feeding, and there were ten pupæ. These I removed to a breeding-cage, placing them on the bare wooden floor, and it was most amusing to watch them travel over this by means of their segmental hooks; with a curious sideways twist of the tail they got up quite a respectable pace. The first insect (a male) emerged on July 14th, and the remaining nine (six males, three females) during the following week, the last two making their appearance on the 23rd. They are all fine specimens, the three females being quite as large as any I have seen. During the hot days of September I have often seen the larvæ of *C. ligniperda* apparently sunning themselves on the trunks of infested trees; they keep the anal claspers just within the mouth of the burrow, and at the least alarm slip in backwards, and it needs some practice to catch them; if you do not seize them firmly at the first attempt, they slip through your fingers and are gone.—T. B. ANDREWS; 276, Broadway, Bexley Heath, Kent, August 24th, 1901.

SECOND BROOD OF EPINEPHELE IANIRA AND *E. TITHONUS*.—At Paignton, in South Devon, Mr. H. Main found, on August 20th, *E. ianira* in numbers in the freshest of condition, constituting without doubt a second brood; and on August 22nd, near Teignmouth, I met with *E. tithonus* under the same circumstances. *E. tithonus* was flying with poor worn specimens of the earlier brood. The fresh insects were particularly rich in colour, and in both cases the fringe on the wings was very perfect.—W. J. LUCAS.

DAVUS var. ROTHLIEBI AT DELAMERE.—I have read with considerable interest Mr. Arkle's remarks on the Delamere form of the above insect (*ante*, p. 257). I have collected some hundreds of specimens from this locality, and agree with Mr. Arkle in this, that the ocelli are on the average much larger than those of specimens from other districts; but I must confess that I have never been so fortunate as to take one with the ground-colour of the under wings "white," or, more extraordinary still, with "spots about a quarter of an inch across" (an enormous proportion to the size of the wing), nor have I seen a single specimen

anything approaching those described; and, being an entomologist who pleads guilty to "a weakness for 'spots' and 'undersides'," I fervently hope that Mr. Arkle will exhibit these remarkable aberrations at one or more of the Entomological Societies, and thus give pleasure to many who, like myself, are interested in the variation of species.—B. H. CRABTREE; "The Acacias," Levenshulme, Sept. 12th, 1901.

PTEROSTOMA PALPINA DOUBLE-BROODED. — I was much surprised, on looking one morning last month in my breeding-cage, to find five freshly-emerged specimens of the above-named species—two males and three females; and on visiting a friend near here a night or so later I found that he had had the same experience with his. We have made inquiries, and have come to the conclusion that the appearance of a double brood, the imagos of which are about the normal size, is most unusual. I may add that at the present time I have healthy larvæ feeding from a pairing of this brood.—A. J. LAWRENCE; Bromley Common, Kent, September 11th, 1901.

LEPIDOPTERA OF LEWIS.—Mr. H. McArthur, who has been collecting in Lewis, the most northern island of the Hebrides or Western Isles of Scotland, returned to London early in September. Although he found sugar unattractive for moths, he succeeded in getting together a most interesting collection. The series of one or two of the species obtained are especially fine as regards aberration from typical lines, and he has also secured specimens of some species not previously recorded from the locality. We are indebted to him for an opportunity of seeing the entire collection, but must defer further remarks thereon until next month.

LATE BROOD OF PACHYCNEMIA HIPPOCASTANARIA.—On July 25th, 1898, I took *P. hippocastanaria* in the New Forest. The following year (July 20th) several specimens were obtained by my father and myself at Oxshott. These were all taken on heaths in the daytime. This year we took two very fine fresh specimens (August 4th) at Woking by searching the heather at night with a lantern. Is this insect regularly double-brooded? Of the four books I have by me, Meyrick gives May only, as also does Morley. Newman says May, and in France a second brood. Hofmann says July and August on the Continent, but, as he also gives these months for the larva, there is probably some mistake. One would be glad to know other collectors' experiences with this insect.—F. M. B. CARR; 46, Handen Road, Lee, S.E.

I took a male specimen of *P. hippocastanaria* at Oxshott on July 17th last, and was then under the impression that a summer generation of this species was unusual. Mr. Barrett, however, in the recently published vol. vii. of his 'Lepidoptera of the British Islands,' states that emergence takes place in April and May, sometimes as early as March, and that there is "a partial second generation in August." In 'British and European Butterflies and Moths,' by Kappel and Kirby, the time of the imago is given as "April to July." Other authors consulted only give the date of spring brood.—R. S.

THREE GENERATIONS OF SELENIA ILLUSTRARIA IN ONE YEAR.—*S. illustraria* being generally double-brooded, I thought perhaps the following

details of my experience would be interesting. From some chrysalids received in exchange I obtained specimens from March 12th to the 21st inclusive, the first being a male, which I killed, thinking it only an isolated case of abnormally early appearance. On the 16th, however, I was surprised to see another out, also a male; and on the 17th a fine pair, from which I obtained fertile ova on the 18th and 19th. These began hatching on April 11th, the larvæ beginning to pupate on May 22nd, the moths emerging from June 7th to 17th inclusive. From these I obtained ova on June 11th, 12th, and 13th, the larvæ appearing on June 26th and 27th, and starting to pupate on August 8th; and of course I expected these to hibernate in the pupa state, and was considerably surprised to see a specimen in the cage on August 20th, and others on the 21st, 22nd, and 23rd, all being males. I was disappointed at this, but on the 26th, however, I was delighted to see a pair in the cage, from which I obtained fertile ova, which commenced hatching on the 9th inst. I have thus succeeded in obtaining three distinct broods, the latter of which were the same size as the ordinary second brood. Now I come to what I think the most curious part of my experience, as I have still six large larvæ and two which spun up yesterday from the same lot of ova that produced imagines from August 20th to 26th inclusive. They are about three times the size of those which pupated from August 8th on. Thus, you will observe, I have larvæ from the same batch of ova, some of which pupated in six weeks, and two in about ten weeks; while I still have six feeding up, and, if I am successful in rearing, should produce very large specimens. All dates and particulars given in the above I have taken from my diary, which I keep posted from day to day, and which I find a splendid plan for reference should one require to obtain fresh series of any particular species at any time. — RICHARD GARRATT; 5, Clive Crescent, Penarth.

SESIIDÆ OF NORTH AMERICA.—We have just received vol. i. part 6, of the ‘Memoirs of the American Museum of Natural History,’ dated March, 1901, which contains a “Monograph of the Sesiidæ of America, North of Mexico.” It contains 136 pages of letterpress, and eight excellent coloured plates of the moths, and the galleries of their larvæ in the interior of the trunk, branches, stems, or roots of the plants which they attack. There are additional illustrations in the text, and a very full bibliography. The scientific portion of the work seems to be excellently done, and the destructive character is referred to of some of the species, of which the best known is our own Currant Clearwing (*Sesia tipuliformis*), which has been introduced with the currant into many other parts of the world, and is now common in Europe, North America, Australia, and even New Zealand. The references given by Mr. Beutenmüller fill more than two of his very large pages, in very small type.—W. F. K.

NORTHUMBERLAND ODONATA.—Mr. G. Bolam, of Berwick-on-Tweed, has forwarded to me for identification several dragonflies from the North of Northumberland. They are *Sympetrum striolatum* (Chathill); *S. scoticum* (Chathill); *Libellula depressa*; *L. quadrimaculata*, including one of the immigrants to Berwick noticed last year; *Æschna cyanea*, of which Mr. Bolam says that it is “the most common or best

distributed dragonfly in these parts and far north into Scotland"; *Ischnura elegans* (Chathill). The most interesting are *L. depressa*, of which I had no definite records north of Cheshire (though De Selys says it is found in all three parts of the British Isles), and *Æ. cyanea*, previous records of which north of Yorkshire needed confirmation. In connection with the last it should be stated that, although the specimen sent was *Æ. cyanea*, it is quite possible that some of the numbers mentioned by Mr. Bolam should be referred to its close congener, *Æ. juncea*, which is much more of a northern insect.—W. J. LUCAS; Kingston-on-Thames.

VISITORS TO SUGAR.—From time to time several uninvited visitors to lepidopterists' sugar have been recorded in these pages, chiefly amongst the Neuroptera and Orthoptera. A few more have come under my notice during 1901. *Phryganea minor* was taken in the New Forest on July 27th; and *Micropterna lateralis* in the New Forest in August; while the little cockroach *Ectobia panzeri* occurred freely at Dawlish in the middle of August. At Dawlish also there were considerable numbers of a brown insect belonging to the *Thysanura*, while in the New Forest two species of *Myriapoda* were noticed.—W. J. LUCAS; Kingston-on-Thames.

LARVÆ OF *CASSIDA EQUESTRIS* FEEDING ON HEMP-NETTLE.—Towards the end of July, Mr. Step gave me some larvæ and pupæ of a species of *Cassida* which he had found on Wisley Common feeding on hemp-nettle (*Galeopsis tetrahit*). I succeeded in rearing the specimens, which it was thought would turn out to be one of the uncommon species of *Cassida*; they however proved to be *C. equestris*. I do not think it is known that this species feeds on *Galeopsis*. Fowler gives its food-plant as species of *Mentha*, or mint. The specimens were only six days in the pupa.—S. W. KEMP.

NOTES ON *VANESSA IO* AND *V. CARDUI*. — It would be somewhat interesting to know the reason of *Vanessa io* being less abundant, especially in some districts, than either *V. atalanta* or *V. urticae*. Feeding as the larvæ do on the nettle so often abundantly distributed as a weed, and at times when both those other insects may be commonly seen, it seems difficult to account for the non-appearance of this butterfly. According to my own experience, it certainly seems to rather favour some districts more than others at the present day. In many a secluded valley in Wales, in some quiet combe of Somerset or Devon, there I have seen it in moderate numbers, season after season, when I heard of its non-appearance in other localities apparently quite as favourable to its production—and that, too, when *urticae* and *atalanta* have been abundant. In Glamorganshire, Carmarthenshire, Cardigan, Montgomeryshire, Brecon, and Merioneth, I have seen both larvæ, these especially abundant at times, and the imago for several seasons. But I well remember, when a lad, that the "Peacock," as we then called it, used frequently to appear in gardens in Wiltshire in the early autumn at the blossoms of the asters and other flowers. Can the cause for this apparent scarcity arise from any ichneumon parasite attacking the larvæ being more abundant in some districts than others? or may the imagines be more delicate, and perhaps perish during their

hybernation? or may the larvæ be more often attacked by birds in some places than others? As regards hybernation, the Welsh valleys would be both *moister* and in many instances colder in the winter than in some other counties. In fact, it seems one of those mysteries in insect life difficult to comprehend and explain. And then of *Vanessa cardui*: its food-plant, a perfect pest often to the agriculturist, increased of late years in many districts, and yet this butterfly is scarcely seen season after season. In referring to my notes, I have only recorded 1892 as a good *cardui* year, although some few appeared in 1894, and this in a *seventeen years'* record. But *cardui* prefers, I think, warm dry districts like the limestone or chalk.—T. B. JEFFERYS; Bath.

CAPTURES AND FIELD REPORTS.

PIERIS DAPLIDICE IN JERSEY.—On Aug. 9th, while collecting at Pontac, in Jersey, I obtained a very good specimen of *P. daplidice*. I should like to know if this butterfly occurs commonly in the island.—S. F. P. BLYTH; Cleaveland, Chislehurst, Kent, Sept. 4th, 1901.

COLIAS HYALE IN BERKSHIRE.—This is now the second year in succession it has been my good fortune to take the pale clouded-yellow butterfly, my first capture this season being on Aug. 20th, at Streatley, flying over clover. I then netted two specimens, and saw another, which I failed to catch. Since this date I have taken four more, all being very perfect, and apparently freshly emerged. Although I have carefully searched lucerne and clover fields, in full bloom, for *C. edusa*, up to the present I have not seen one. This is somewhat curious, considering how plentiful it was in both Oxfordshire and Berkshire last year.—HAROLD THOMPSON; 31, Beaumont Street, Oxford, Sept. 11th, 1901.

COLIAS EDUSA AND *C. HYALE* IN BUCKINGHAMSHIRE.—I had my first glimpse of *C. hyale* on Aug. 18th, at Chesham, when I gave chase to a specimen that was flying rapidly over a clover-field. It was not captured. On the 19th, when journeying from Chesham to Rickmansworth, I noted one *C. hyale* flitting about a small patch of lucerne, close to the line near Chalfont Road station. Finding clover-fields rather scarce at Rickmansworth, on the 21st I went to Chalfont Road and took two *C. hyale* on the patch of lucerne referred to; also two more from clover-fields when returning to Rickmansworth. I went again on the 22nd and took seven specimens, and on the morning of the 25th (a hazy morning) I netted four, and one example of *C. edusa*. Other *hyale* were seen, but only the one *edusa*.—G. B. OLIVER; Tettenhall, Wolverhampton, Aug. 27th, 1901.

COLIAS HYALE IN ESSEX.—We have at Southend this year an abundance of *C. hyale*. I have not seen it here in such numbers since the summer of 1892; then it was accompanied by *C. edusa*; this year the latter species is absent.—(Rev.) HENRY C. LANG; All Saints Vicarage, Southend-on-Sea, Sept 3rd, 1901.

COLIAS HYALE IN HAMPSHIRE.—I had a fine specimen of this butterfly brought to me by a friend this morning, who also saw another,

which, however, he failed to capture. It is the white form and, judging from its fine condition, it appeared to be newly emerged.—FRED. G. BELLAMY; Ringwood, Sept. 6th, 1901.

COLIAS HYALE IN KENT.—During a short stay at Folkestone, in August, I took one female *C. hyale* on the 5th, and although I kept a sharp look-out during the succeeding days for others, did not see another until the 13th, when over some lucerne I captured two females and one male. Ova were obtained from two of these, but in neither case have they proved fertile. These were all the *Colias* I saw during the fortnight I spent in the neighbourhood.—JOSEPH H. CARPENTER; Riverdale, Leatherhead, Sept. 6th, 1901.

I have found this species pretty plentiful this year in Margate, Broadstairs and Ramsgate district. I arrived at Margate on Aug. 24th, and they had then been flying a fortnight; a friend up to that time had taken fifty. On the 26th a north-westerly gale sprang up, and continued, in varying degrees, till the 31st, when I left. In every patch of lucerne in the district which came under my observation *C. hyale* was to be seen. I had very little time to do any collecting, and, as so often happens, when I had a net the wind was strongest, and the sky became overcast; and when I had none the sun shone brightly, and *hyale* was plentiful. I managed, however, to bag in all thirty-two specimens, including two worn and two fresh pale females, twenty of which I took in an hour and a half, during a fine interval on the 30th. Given more leisure, and better luck in the way of weather, I have no doubt I could have trebled the number. I did not see a single specimen of *C. edusa*. At Folkestone, on Sept. 5th—a grand day—not a single specimen of either *C. hyale* or *edusa* was to be seen, and I have only heard of a few being taken there.—C. W. COLTHRUP; 127, Barry Road, East Dulwich, S.E., Sept. 17th, 1901.

I noticed a fair number of *C. hyale* on the cliffs beyond Margate a week or two since.—(Rev.) HENRY C. LANG; All Saints Vicarage, Southend, Sept. 3rd, 1901.

C. hyale has again made its appearance in this district. I took four freshly-emerged specimens on the 18th inst., and two on the 21st, and have seen three others. I kept a sharp look-out on the lucerne fields all spring and early summer but did not see one, and had almost given up hope. Last year I took several specimens in June, and in September I obtained about thirty.—T. B. ANDREWS; 276, Broadway, Bexley Heath, Kent, August 24th, 1901.

COLIAS EDUSA IN KENT.—Since my note of the 24th inst. on *C. hyale*, *C. edusa* has also put in an appearance; I yesterday took twenty-five (twenty-four males and one female), and saw many more. *Hyale* is now more abundant than this time last year, but among thirty odd captures to date I have only taken five females.—T. B. ANDREWS; 276, Broadway, Bexley Heath, Kent.

COLIAS HYALE AND C. EDUSA IN KENT.—While collecting at Folkestone (Aug. 19th to 31st), with the help of two of my sons, we managed to net about a dozen fine *C. hyale*, but only saw two *C. edusa*. *Lycana bellargus* (second brood) were out in plenty on the 20th, but all males. We did not see one female until the 23rd.—W. E. BUTLER; Hayling House, Reading, Sept. 7th, 1901.

Two friends and myself captured thirty-three specimens of *Colias hyale* and two of *C. edusa*, over lucerne at Sheerness, on August 24th last. I have now several larvæ feeding of the former species, from ova deposited during the last week of August. As usual, we found the females much scarcer than the males; in fact, excepting four or five, all were of the latter sex.—F. W. FROHAWK; September, 1901.

COLIAS HYALE IN SURREY.—I saw a nice specimen of *C. hyale* here on Aug. 31st. I was particularly pleased at seeing it, since, although I kept a sharp look-out, I did not see one last year.—L. M. SETH SMITH; Alleyne, Caterham Valley, Surrey.

VANESSA ANTIOPA IN BUCKS.—Two young entomologists, Messrs. Clavell and Ruthven Hore, of Dulwich College, have shown me a fine male specimen of the Camberwell Beauty, which they captured in a garden at Gerrards Cross, near Uxbridge, Bucks, on Sept. 7th. It is in very good condition, so that, according to current theories, I suppose that it was born and bred in England from Continental parents that came over in the spring. I may mention that the borders of the wings are completely white, although this character is now considered insignificant for distinguishing English from Continental specimens.—GEOFFREY SMITH; Ivy Bank, Beckenham.

VANESSA ANTIOPA IN ESSEX.—Mr. A. W. Tancock, writing from Chelmsford, records in the 'Field': "We had a Camberwell Beauty (*Vanessa antiopa*) here on Sept. 7th. We saw it sunning itself on a wall of the stable for several minutes shortly before one o'clock, and could easily have caught it if we had wished. It was seen in the kitchen-garden later in the afternoon. It was a fairly good specimen." F. W. FROHAWK.

VANESSA ANTIOPA IN SUSSEX.—A specimen was seen settled on a sunflower at Southwick, Sussex, on Aug. 26th last. My informant almost succeeded in capturing it, having placed a net over both flower and butterfly, but it managed to escape by darting downwards through the foliage.—F. W. FROHAWK; September, 1901.

LIMENITIS SIBYLLA IN WOOLMER FOREST.—On July 17th of this year I had the pleasure of seeing this insect in abundance, in the glades between the Portsmouth Road and Waggoner's Wells, near Grayshott. A. O. ROWDEN; 6, Eastgate, Exeter.

APATURA IRIS IN SUSSEX.—A splendid example of *A. iris* was taken, near Heathfield, on July 22nd last. It is a male insect, and is in perfect condition.—W. DELVES, Jun.; Maynards Green, Horeham Road, Sussex.

CYANIRIS ARGOLUS ABUNDANT AT SOUTHEND.—This species has been very abundant here at Southend this season. It frequents my garden and other localities in the district every year, but this year we have seen it everywhere. The second brood has been specially noticeable by the unusual number of specimens, and even now, in the first week of September, some stragglers are left. I noticed a specimen about the second week of August, flying down Arundel Street, Strand; perhaps the species has established itself in the Temple Garden.—(Rev.) HENRY C. LANG; All Saints Vicarage, Southend.

LYCÆNA MINIMA (ALSUS) DOUBLE-BROODED.—With reference to Mr. L. M. Seth-Smith's note (*ante*, 254) on the capture of a perfect specimen of the above species on Aug. 5th, I found this little butterfly in some numbers at a certain locality in Western Hertfordshire, on Aug. 3rd last. All the specimens actually captured, nine in number, were in perfect condition, and had the appearance of having only recently emerged.—PHILIP J. BARRAUD; Bushey Heath, Herts.

ACHERONTIA ATROPOS IN KENT.—I have had a single pupa of this species given me at Deal, but it does not seem nearly so plentiful there this year.—C. W. COLTHRUP; 127, Barry Road, East Dulwich, Sept. 17th, 1901.

ACHERONTIA ATROPOS IN NORFOLK.—From the October issue of the 'Entomologist,' 1900, I noticed that the larvæ of the above species had been very abundant in Norfolk last year. I write now, after but a brief month's residence in Norwich, to report that it is undoubtedly very common in the neighbourhood this year. From Aug. 20th to Sept. 11th I have found nine *atropos* larvæ, received three pupæ from potato-diggers, and traced twenty other specimens. Though I had to snatch an hour or two when I could spare time, I have cycled out of the city on three or four points of the compass, and almost in every case found *atropos* in the very first patch of potatoes. For the majority I was too late, but systematic searching soon revealed denuded plants, with the frass lying in quantities below. The ninth larva has entered the cocoa-nut fibre provided for it, to-day.—(Rev.) ARTHUR MILES MOSS; The Close, Norwich, Sept. 14th, 1901.

ACHERONTIA ATROPOS IN NORFOLK.—I beg to report the occurrence here of three full-grown larvæ of *A. atropos*. The last of the three I obtained on Sept. 9th, one on Aug. 24th, whilst the first one was found on July 28th, and went down into the soil on that date. I had a number of *Smerinthus ocellatus* larvæ; these were all full-grown, and had gone down into the earth before the end of July. Previously I had never found full-grown larvæ before the middle of August and during September.—J. W. WOOLHOUSE; Summer Hill, Fakenham, Norfolk, Sept. 17th, 1901.

SPHINX CONVULVULI AT BROMLEY, KENT.—I caught a very fine specimen of *S. convolvuli* on Aug. 30th, in my garden here, at the blooms of *Nicotiana affinis*.—L. F. HILL; 2, Freeland's Road, Bromley, Kent.

SPHINX CONVULVULI IN THANET.—Two specimens of *S. convolvuli*, both males, in very fine condition, have been picked up at Margate, Sept. 4th and 9th (I also received a third specimen from Bridport, Dorset, taken Sept. 3rd; the latter, a female, exactly $4\frac{1}{2}$ in. across, travelled alive in a tin cigarette-box without much damage).—J. P. BARRETT; 3, St. John's Villas, Margate.

SPHINX CONVULVULI IN NORFOLK.—I received a living specimen of *S. convolvuli* on Aug. 20th. It was found here at rest under some leaves.—J. W. WOOLHOUSE; Summer Hill, Fakenham, Norfolk.

SPHINX CONVULVULI NEAR SOUTHAMPTON.—On Aug. 13th I caught a very large specimen of *S. convolvuli*, flying over tobacco-flower in a garden at Hythe, near Southampton. Two nights later another

specimen appeared, which I also caught; both are females, in very good condition, though not absolutely perfect. Towards the end of the month I saw another specimen, flying in the rain, which I failed to capture.—S. W. KEMP; 80, Oxford Gardens, Notting Hill.

SPHINX CONVULVULI IN SURREY.—On Aug. 25th last I found a specimen of *S. convolvuli*, at rest on a paling here.—L. M. SETH-SMITH; Alleyne, Caterham Valley, Surrey.

SPHINX CONVULVULI IN SUSSEX.—A fine specimen of *S. convolvuli* was taken here on Aug. 12th, and two or three have been seen since. W. DELVES; Maynard's Green, Horeham Road, Sussex, Sept. 3rd.

I was given a fine living specimen of *Sphinx convolvuli* a short time ago. It had been captured by one of the railway officials, and my friend saw it reposing, quite quietly, near the booking-office at Lewes station. The man stated there were several in the gardens near the line.—J. M. H. MACKINNON; Oaklea Warren, Newick, Sussex, Sept. 10th.

SPHINX CONVULVULI IN SCOTLAND.—A fine specimen of *S. convolvuli* was taken at Elgin, on Aug. 13th last.—HENRY H. BROWN; Cupar Fife.

SPHINX CONVULVULI PUPA.—I have recently received a very fine living pupa of *S. convolvuli*, which was found by a person employed digging potatoes on the Sussex coast, on Sept. 4th. This is the first living specimen I have seen, found in this county. In searching through the 'Entomologist,' vol. i. to present date, I find only two pupæ are recorded as having been found, one on Oct. 18th, 1876, and one on Oct. 31st, 1884. I think there is no doubt that *S. convolvuli* pupæ are but very seldom found, yet I think, if more careful observation were kept by potato-diggers, they would be more frequently turned up, especially as potato-fields overgrown with the wild convolvulus (*Convolvulus arvensis* and *C. sepium*) are usually the places where the larvæ feed. I may mention that my friend, Mr. Jos. F. Green, informs me that in North Suffolk *S. convolvuli* has swarmed since Aug. 17th last; on that evening he captured seven specimens, and they occurred so commonly each subsequent evening at the tobacco plants that he gave up capturing them. I have also received specimens from Sussex and Ireland, and notices of their appearance in Scotland. F. W. FROHAWK; September, 1901.

SPHINX CONVULVULI IN LONDON DISTRICT.—I have pleasure in announcing the capture of a specimen of the above insect near here, on the 20th inst., at rest on the framework of an electric street-lamp, in full glare of its rays. The evening was very showery, but at the time of capture there was no rain falling.—GEO. P. KITCHENER; 7, Montpelier Road, St. John's College Park, N.W., Sept. 21st, 1901.

MACROGLOSSA STELLATARUM.—We saw, for the first time this year, *M. stellatarum*, on the evenings of Sept. 7th and 8th. Last year several haunted the garden (especially a bed of *Phlox drummondii*) from the end of July on into November.—J. M. H. MACKINNON.

MACROGLOSSA STELLATARUM IN THANET.—*M. stellatarum* made its appearance on Midsummer Day, apparently having hibernated from October last (see *ante*, p. 21). I saw dozens early in July, but none before Midsummer. They were then in good condition, but rapidly

battered themselves. I think (and I have reason for thinking so) we have one brood; the larva is full-fed now, and the imago hibernates from October to May or June. I should like corroboration or otherwise of this.—J. P. BARRETT; 3, St. John's Villas, Margate.

STERRHA SACRARIA IN WORCESTERSHIRE.—I have just received from a neighbour, Mr. T. F. Bode, a specimen of *S. sacraria*, taken in August of last year, in his garden. The capture of this rare insect, described as "a casual immigrant only," in the very heart of England, seems worthy of note.—(Rev.) A. DAY; The Vicarage, Malvern Link, Worcestershire.

OROBENA EXTERNALIS (MARGARITALIS) IN SUFFOLK.—I should like to record the capture of *O. externalis* in the neighbourhood of Tuddenham, Suffolk (*vide* Bloomfield's 'Lepidoptera of Suffolk,' Supplement, p. 4). I took the first specimen in 1898, about the middle of June. This year I found them plentiful in one field, and a friend took twenty specimens in the same field a few days afterwards. This species is recorded for Cambridgeshire, I believe, but not previously for Suffolk.—E. G. J. SPARKE; 1, Christchurch Villas, Tooting Bec Road, Tooting, S.W., Sept. 24th, 1901.

XANTHIA GILVAGO AT TOOTING.—I took a good specimen of *X. gilvago* at sugar, in the garden here, about 9 o'clock last night. Last year I captured two examples of this moth in the same place, and about the same time, but they were somewhat damaged.—E. G. J. SPARKE; 1, Christchurch Villas, Tooting Bec Road, Tooting, S.W., Sept. 24th.

ZYGÆNA (ANTHROCERA) FILIPENDULÆ, Linn., IN BANFFSHIRE.—While my son and I were examining some grassy banks, thickly clothed with bracken and thistles, near the sea at Cullen, about midday on July 16th last, we came upon a swarm of *Z. filipendulæ*. On every thistle-head there were a few, and on some we counted six. Next day they were fewer, and in a few days they disappeared.—H. H. BROWN; Cupar Fife.

CALLIMORPHA HERA IN THE EXETER DISTRICT.—This insect appears to have been as abundant as ever this season between Exeter and Teignmouth, particularly in the neighbourhood of Starcross. As, however, records of its capture seem confined to the western side of the Exe estuary, it may be interesting to hear if entomologists have taken it on the eastern side. In August, 1900, I took two specimens (both males) on the Honiton Road, three miles east of the Exe.—A. O. ROWDEN; 6, Eastgate, Exeter.

[The earliest record of *C. hera* in England is that of Mr. D'Orville, who captured a specimen on August 14th, 1871, at Alphington, near Exeter. *Vide* Entom. v. 414, and xxv. 257.—Ed.]

CATOCALA NUPTA IN LONDON.—I found a larva of *C. nupta* in Park Square, N.W., on July 19th. It became a pupa almost at once, and on Aug. 12th it produced a fine moth.—DORRIEN HODGE; Holy Trinity Rectory, St. Marylebone.

CIRRHÆDIA XERAMPHELINA IN NORTH WALES.—On Saturday, Aug. 24th, I took a fine specimen of *Cirrhædia xerampelina*, at rest on a pine-tree at Drwsynant, near Dolgelly, North Wales.—B. HICKLIN; Cranford, Winchmore Hill, N.

PLUSIA MONETA AT BROMLEY, KENT.—This species is becoming fairly common here. I have taken four this year, in my garden, and twenty-seven larvæ; of the latter, five spun up, and the moths emerged the middle of August; the rest are evidently remaining over till next year, so I have replaced them on the monkshood plants out of doors. Last season I caught five, and took fifteen larvæ towards the end of July, nine of which came out early in August. Has anyone noticed how much more plentiful the larvæ of this species are from the middle to end of July, than in May and early in June? The larva of the second brood spins the flower together, and is very easily discovered. L. F. HILL; 2, Freelands Road, Bromley, Kent.

PLUSIA BRACTEA IN SCOTLAND.—I have much pleasure in recording the capture of *P. bractea* by Mr. A. E. Officer, at Conon Bridge, Dingwall, N.B., on August 19th. The insect came to an open window about 10.30 p.m.; it is rather rubbed on the thorax, but otherwise is a very fine specimen indeed.—WM. A. CARTER; Burr Villas, Bexley Heath, Kent, Sept. 9th, 1901.

ODONATA AT HYTHE, KENT.—During a stay at Hythe, Kent (August 22nd to Sept. 5th), the following dragonflies were seen or taken:—*Sympetrum striolatum*, fairly common. *S. sanguineum*, one male, in bad condition, by the Military Canal. *Ischnura elegans*, fairly common. *Æschna mixta*, one or more examples seen every day from Aug. 29th to Sept. 4th. I succeeded in obtaining two males and two females, whilst Mr. S. W. Kemp also took two males.—F. M. B. CARR; 46, Handen Road, Lee, S.E.

DEIOPEIA PULCHELLA IN SURREY.—Since writing you on July 7th (*ante*, p. 230), I have had the good fortune to take two further specimens of *D. pulchella*, in the same locality as my first capture. I should have taken a fourth example on July 15th, but it unfortunately escaped, owing to my inability to follow it, in consequence of the marshy nature of the ground. An additional point of interest is, that the larval food of this species, the forget-me-not (*Myosotis palustris*) occurs in the locality in abundance, conclusively proving that the presence there of this beautiful insect is not the result of accident or chance, but that it actually breeds there.—ERNEST WARNE; 4, Spanish Road, East Hill, Wandsworth, S.W., Aug. 13th, 1901.

[In reply to our request for further particulars, Mr. Warne writes, in a letter, dated August 30th]—The precise locality where I was fortunate enough to take *D. pulchella* is near Earlsfield, on some waste ground belonging to some factories on the banks of the Wandle. One portion is very marshy, and the other a grassy meadow. A wide and deep ditch from the Wandle divides the two. The other side of the river is rough ground, covered with short grass and weeds. The specimens are smaller than those I have seen in the museums, being not much larger than, say, *Lithosia helveola*. I took some examples of *E. chlorana* there, although I saw no osiers about. Probably they fed on the willows which line the bank of the river.—ERNEST WARNE.

BOLETOBIA FULIGINARIA AT WALTHAMSTOW.—On July 29th last I was fortunate enough to take a specimen of *B. fuliginaria* in my garden at

Hale End. The insect was flitting round a sugared post, though I cannot say whether it was attracted by the sugar or not; it is in good condition. I had never seen the species before, but it has been identified by my friend Mr. Prout.—R. W. ROBBINS.

RHIZOTROGUS SOLSTITIALIS.—In reference to Mr. P. J. Barraud's note (*ante*, p. 256) I may mention that during July this species was extremely abundant at Netley and Woolston, near Southampton. One could easily have taken hundreds almost any evening. A single specimen, taken in Plymouth, was given me, and a few were sent from Exmouth, together with a female *Dorcus parallelipipedus*. I may also note that on June 9th I captured three specimens of *Pachyta octomaculata*, near Plymouth.—A. VINCENT MITCHELL; 81, Salisbury Road, Plymouth, September, 1901.

CERAMBYX ÆDILIS IN SOUTH YORKSHIRE.—It has been my good luck to have procured two of this, I believe, rather rare beetle, taken at the foot of a chimney, also near to a wood in the Rotherham district; three others were also put aside for me, but by some unexplained means they disappeared, with the boxes that contained them, probably the joke of a fellow-workman. Donovan, in his book of the 'Natural History of British Insects,' vol. ii., speaks of this species as scarce all over Europe, and extremely rare in England. I should be glad to know if it still remains rare in this country. My specimens were taken the second week in August.—W. BROOKS; Grange Hall, Rotherham.

ANESYCHIA (PSECADIA) BIPUNCTELLA.—I beg to record the appearance of *A. (P.) bipunctella* in my breeding-cage, on June 20th, 1901. Unfortunately I am not sure where I took the larva, as the insect is one of a number of micros I have reared, but believe it came in with some of my food-plants, which, however, did not include viper's bugloss.—J. T. FOUNTAIN; 149, Vaughton Street, Birmingham, July 24th, 1901.

[In answer to enquiries, Mr. Fountain informs us that the insect referred to in his note has been identified from the figure of *P. bipunctella* on plate 62 in Kirby's 'European Moths and Butterflies.' He also adds, "I have had no food-plants out of England."—Ed.].

NOTES ON BUTTERFLIES FROM THE MARITIME ALPS.—Whilst on my holidays in July in the Maritime Alps, I had the good fortune to find *Læosopis roboris* unusually abundant at St. Martin Vesubie. I have on former occasions observed single specimens of this rare Lyценid in that locality, and also at Digne, but do not think that it often occurs in France in such numbers as it did this year at St. Martin. I found a particular walnut sapling remarkably attractive; one of the branches had been broken accidentally by myself at my first visit to it during the last week of June, and probably the strongly-scented sap was the cause of attraction. Round this bush I took nearly forty specimens, and could have taken many more. I saw and took it in other parts of the environs of the town, and once noticed it actually in the town itself. The female was very scarce until the third week of July, after which it became the commoner sex. This species loves the hottest sunshine, and disappears instantly if the slightest cloud obscures the sun, though it can be beaten occasionally out of bushes and herbage

even in the rain. There are very few oaks in the vicinity of St. Martin, and these are all young trees. I have never seen it flying round oaks, but this is no proof that the larva selects any other food plant. *Papilio alexanor* was very much commoner at St. Martin than I have ever noticed on previous visits to that place, but nothing approaching in abundance to its appearance near Digne two years ago. With the exception of *Eneis allo*, fairly common at the Madone Fenestro, I took nothing remarkable besides a well marked and freshly emerged hermaphrodite of *Melitæa didyma*, and, at Bollene, a curious aberration of *Lycæna arion*, with a very light ground colour and broad black marginal borders. At Bastia, in Corsica, I was struck with the abundance of *Argynnis pandora* and *Papilio machaon* on waste ground immediately outside the town. I have rarely noticed butterflies so abundant within a few moments' walk of busy town streets. The railway strikes prevented my intended visit to the interior.—HENRY C. LANG; All Saints Vicarage, Southend-on-Sea.

NOTES ON LEPIDOPTERA FROM WILTSHIRE.—During part of the summer I was staying near Devizes, and the following is a list of some of my captures whilst there. May:—Several specimens of *Scotosia certata*, caught at dusk flying round *Berberis vulgaris*; *Lycæna argiolus*, the first brood was very plentiful. June:—*Lycæna alsus*, generally distributed along the foot of the Downs. *L. adonis* and *Procris geryon*, both in profusion on the slopes of the Downs. *Agrotis cinerea*, one female specimen at rest on wild thyme. *Eurymene dolobraria*, one specimen in perfect condition on the top of the Downs far from trees of any kind. *Charocampa elpenor* and *U. porcellus* and *Sphinx ligustri*, all taken at honeysuckle towards the end of the month, the former in some numbers. July:—I was so fortunate as to capture two specimens of *Plusia moneta* on the wing at dusk—a female on 15th, and a male on 19th. There is plenty of larkspur (*Delphinium*) in the garden, but no monkshood (*Aconitum*). I have seen records of the capture of *P. moneta* this year from Berks and Hants, but this is, I think, the first recorded occurrence of the species in Wilts. This addition to our British Lepidoptera seems to be spreading rapidly through the country. August:—*Lycæna corydon* began to appear in its usual profusion over the Downs at the end of July, and on August 9th I caught my first two specimens of the season of var. *syngrapha* (the female variety of *L. corydon* with the blue colouring of the male). The commonest form of this variety here has a black discoidal spot in the centre of the fore wings; some are without this spot; and I caught one this year with the spot on both fore and hind wings. Another not uncommon variety of *L. corydon* (female) has white discoidal spots, with or without black centres, on fore or hind wings, and sometimes on both. I also caught one female specimen with blue fore wings and brown hind wings. *L. alsus* was taken in perfect condition this month, and must, I should think, have been a second brood. Emergence of the second brood of *L. argiolus* and *L. adonis* was interrupted by bad weather, and they occurred in small numbers only.—(Rev.) C. A. SLADEN; Burton Vicarage, Chester.

RECENT LITERATURE.

H. GARMAN. *Enemies of Cucumbers and Related Plants, &c. : The Food of the Toad.* (1901 Bull. Kentucky Agric. Exper. Sta., 91 pp. 1-68; 5 Plates and 10 text figs. [1-16]).

Among the most destructive enemies of cucumbers are—*Diabrotica rittata* and *I2-punctata*, among beetles; *Aphis gossypii* (melon louse), *Anasa tristis* (squash bug), &c., among bugs; *Margaronia nitidalis* (pickle worm), among moths; *Thrips tabaci*, &c. These and others are fully described and figured, particulars of life-histories added, and remedies discussed.

"The Food of the Toad" is the result of a continuation of the author's earlier studies. Protection and encouragement are urged for the toad on account of the numerous destructive insects that it devours; among these, Prof. Garman found in the toads' stomachs—*Blissus leucopterus* (chinch bug), various aphids and leaf-hoppers, Colorado potato-beetle, wireworms, &c. On the other hand, coccinellids, spiders, and parasitic hymenoptera were also found. The fondness of toads for ants is remarkable, fifty of these having been found in the stomachs of three toads. The total number of individual insects devoured is also very remarkable. Four cases are instanced:—

No. 1—A toad of medium size, captured in October, had eaten 27 ants, 19 wood-lice, 3 spiders, 1 caterpillar, and 10 plant-lice—total 60.

No. 2—A toad, one inch long, captured in a celery patch in September, had eaten 1 caterpillar and 14 ants—total 15.

No. 3—Captured in a strawberry patch in August, had eaten 2 large ground beetles, 1 tiger beetle, 1 *Diabrotica* beetle, 1 coccinellid, 8 small ground beetles, and 9 ants—total 22.

No. 4—taken in July, had eaten 2 Colorado potato-beetles, 1 click-beetle, 4 bugs (Cydnids), 1 tiger beetle, 1 moth, 7 ground beetles, 6 ants, 1 millipede, and 1 wood-louse—total 24.

That is to say: four toads had *recently* eaten 56 ants, 20 wood-lice, 3 spiders, 2 caterpillars, 10 plant-lice, 1 millipede, 1 moth, 24 beetles of varying sizes, and 4 bugs—total 121!

G. W. K.

The Lepidoptera of the British Islands. By CHARLES G. BARRETT. Vol vii. Pp. 1-336. London: Lovell Reeve & Co. 1901.

In this volume the remainder of the Boarmiidae, together with the Geometridae and part of the Acidaliidae, are treated. Altogether, forty-three genera and eighty-five species are referred to. Among the latter *Abraxas pantaria*, *Dasydia torvaria*, and *Mniophila cineraria* are mentioned, but the author does not consider them to be British species. *Tephrosia biundularia*, Esp. (= *crepuscularia*, Hübn.) is discussed at some length, and Mr. Barrett, in his remarks on the *crepuscularia* form of the species, says: "The subject of its distinctness as a species has been treated upon and debated in this country at enormous length, and not wholly without acrimony; but this healthy and somewhat drastic treatment has had the effect of crumbling away every atom of evidence which had been brought forward to establish its distinctness as a species, and of leaving no choice to an unprejudiced mind but the conclusion that these two races form but one species."

We think that an error has been made in referring *B. angulifera*, Butl., to *B. repandata*, Linn., as a Japanese form of that species, and, unless *B. admissaria*, Guen., is to be considered as a form of *B. gemmaria*, Brahm., we believe the latter species does not occur in Eastern Asia.

SUPPLEMENT TO THE 'ENTOMOLOGIST.'

ON THE COLLECTIONS OF INSECTA OBTAINED BY
DR. DONALDSON SMITH IN SOMALI LAND.

BY EMILY MARY SHARPE.

THE following is a list of the species Insecta belonging to the following families:—Lepidoptera, Heterocera, Coleoptera, and Neuroptera, obtained by Dr. Donaldson Smith during his expedition into Somali Land in the early part of 1899, when he was travelling, at the request of His Highness The Gaekwar, to obtain a series of specimens for the Baroda Museum. Many interesting species were collected, including a new species of *Acræa*, which I have named after H. H. The Gaekwar of Baroda.

Family DANAIDIDÆ.

1. DANAIS KLUGI.—*Limnas klugii*, Butler; E. M. Sharpe, P. Z. S., 1896, p. 530; *id. t. c.*, 1896, p. 524; *id. t. c.*, 1898, p. 369. *Limnas chrysippus*, L., var. *klugii*, Butler, P. Z. S., 1897, p. 692. *Danaida dorippus*, Aurivillius (part), 'Rhopalocera Æthiopica,' p. 32 (1898). *Limnas chrysippus*, Dixey (part), P. Z. S., 1900, p. 10.

a. ♂. Bihen Dula; 24th Dec., 1898.

b.-h. ♂ ♀. Biji; 10th, 12th, 15th, 16th Jan., 1899.

i.-n. ♂ ♀. Laskarato; 25th, 28th Jan., 1899.

o.-v. ♂ ♀. Ania; 29th Jan., 1899.

This large series is perfectly uniform in colour, and shows no sign of approach to the characters of *D. dorippus*, which, as may be seen below, occurred at Biji.

2. DANAIS DORIPPUS.—*Limnas dorippus* (Klug), E. M. Sharpe, P. Z. S., 1896, p. 523. *Danaida dorippus*, Aurivillius, *t. c.*, p. 32 (1898).

a.-b. ♂. Biji; 10th, 16th Jan., 1899.

Family SATYRIDÆ.

3. YPTHIMA ASTEROPE.—*Ypthima asterope* (Klug); Butler, P. Z. S., 1897, p. 692; Aurivillius, *t. c.*, p. 77 (1898).

a.-b. Biji; 10th, 16th Jan., 1899.

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Family ACRÆIDÆ.

4. ACRÆA CHILO.—*Acræa chilo*, Godm.; E. M. Sharpe, P. Z. S., 1896, p. 524; Aurivillius, t. c., p. 96 (1898); E. M. Sharpe, P. Z. S., 1898, p. 369.

a. ♂. Biji; 13th Jan., 1899.

5. ACRÆA GAËKWARI, n. sp.—Allied to *A. regalis*, Oberth., but distinguished from that species by a blackish suffusion over the fore-wing. The black spots are also larger.

Primaries: General colour greyish-black, the area above the submedian nervure and along the inner margin red, which is more or less suffused over the wing; near the apical area, below the costal margin as far as the second median nervule, a transparent band is visible; the black spots are distributed as in *A. roegalis*, but are all much larger; apex and hind-margin brownish-black, followed by a row of red spots, terminating towards the discal area in distinct black streaks. Secondaries: Similar to those of *A. regalis*; the black spots being somewhat more distinctly marked; the base of the wing blacker. Under side.—Primaries greyish-black suffused with red, all the black spots strongly indicated, as well as the transparent band; the row of orange-red spots on the apex and hind-margin well pronounced. Secondaries: Ground colour reddish, suffused with yellowish-white, the black spots larger, with distinct red spots visible near the basal area; hind-margin black, relieved by semicircular spots of greyish-white, with a second row of orange-red spots. The under side of this species is somewhat similar to that of *A. caldarena*, Hewits., or *A. pudorina*, Staud. Expanse 2·4 in.

Hab. Near Laskarato, 3000 feet; 21st Jan., 1899. (The type of this species has been presented to the British Museum by His Highness The Gaekwar of Baroda.)

An unnamed specimen in the British Museum collection agrees rather closely in pattern, but differs in wanting the transparent patches on the primaries.

Family NYMPHALIDÆ.

6. PYRAMEIS CARDUI.—*Pyrameis cardui* (Linn.), E. M. Sharpe, P. Z. S., 1896, p. 531; id. t. c., 1896, p. 524; Butler, P. Z. S., 1897, p. 692; Aurivillius, t. c., p. 130, 1898.

a. Laskarato; 25th Jan., 1899.

7. JUNONIA CLELIA.—*Junonia clelia* (Cram.), E. M. Sharpe, P. Z. S., 1896, p. 531; id. t. c., 1896, p. 524; Butler, P. Z. S., 1897, p. 692; E. M. Sharpe, P. Z. S., 1898, p. 369; Dixey, P. Z. S., 1900, p. 12. *Precis clelia*, Aurivillius, t. c., p. 135 (1898).

a.-c. ♂ ♀. Near Laskarato, 3000 feet; 21st Jan., 1899.

8. JUNONIA CEBRENE.—*Junonia crebrene*, Trimen; E. M. Sharpe, P. Z. S., 1896, p. 531; id. t. c., 1896, p. 524. *Junonia cebrene*,

Trimen; Butler, P. Z. S., 1897, p. 692; E. M. Sharpe, P. Z. S., 1898, p. 370; Dixey, P. Z. S., 1900, p. 12. *Precis ænone* (Linn.), Aurivillius (part), *t. c.*, p. 135 (1898).

a. ♂. Bihen Dula; 24th Dec., 1898.

b.-c. ♂ ♀. Bihen Dula; 24th Dec., 1898.

d.-i. ♂ ♀. Biji; 4th, 13th, 15th Jan., 1899.

j. ♀. Near Laskarato, 3000 feet; 21st Jan., 1899.

k. ♀. Ania; 2nd Feb., 1899.

9. *PRECIS TAVETA*.—*Precis taveta*, Rogenh.; E. M. Sharpe, P. Z. S., 1896, p. 531; *id. t. c.*, 1896, p. 525; *id. t. c.*, 1898, p. 370. *Junonia taveta*, Butler, P. Z. S., 1897, p. 692; Dixey, P. Z. S., 1900, p. 12. *Precis limnoria*, Klug, Aurivillius (part), *t. c.*, p. 141 (1898).

a.-c. Near Laskarato, 3000 feet; 21st Jan., 1899.

10. *BYBLIA ILITHYIA*.—*Byblia ilithyia* (Drury), E. M. Sharpe, P. Z. S., 1896, p. 532; *id. t. c.*, 1896, p. 525; Butler, P. Z. S., 1897, p. 692; Aurivillius, *t. c.*, p. 158, 1898; E. M. Sharpe, P. Z. S., 1898, p. 370; Dixey, P. Z. S., 1900, p. 12.

a.-c. ♂ ♀. Biji; 13th, 15th Jan., 1899.

d. ♂. Gan Liban, 5000 feet; 22nd March, 1899.

11. *HYPOLIMNAS MISIPPUS*.—*Hypolimnas misippus* (Linn.), E. M. Sharpe, P. Z. S., 1896, p. 532; *id. t. c.*, 1896, p. 525; Aurivillius, *t. c.*, p. 147, 1898; E. M. Sharpe, P. Z. S., 1898, p. 370; Dixey, P. Z. S., 1900, p. 12. *Hypolimnas misippus*, L., var. *inaria*, Butler, P. Z. S., 1897, p. 692.

a.-d. ♂ ♀. Biji; 13th, 15th Jan., 1899.

12. *HAMANUMIDA DÆDALUS*.—*Hamanumida dædalus* (Fabr.), E. M. Sharpe, P. Z. S., 1896, p. 532; Butler, P. Z. S., 1897, p. 692; Aurivillius, *t. c.*, p. 181 (1898); Dixey, P. Z. S., 1900, p. 13.

a.-d. Biji; 11th, 13th, 16th Jan., 1899.

e. Near Laskarato; 21st Jan., 1899.

f. Jifa Uri, 5000 feet; 27th Jan., 1899.

Family LYCENIDÆ.

13. *LACHNOCNEMA BIBULUS*.—*Lachnocnema bibulus* (Fabr.), Aurivillius, *t. c.*, p. 301 (1898).

a. Laskarato; 25th Jan., 1899.

14. *EPAMERA UMBROSA*.—*Tatura umbrosa* (Butler), E. M. Sharpe, P. Z. S., 1896, p. 526. *Iolaus umbrosa*, Aurivillius, *t. c.*, p. 326 (1898).

a. Bihen Dula; 24th Dec., 1898.

15. *SPINDACIS WAGGÆ*.—*Spindacis waggæ*, E. M. Sharpe, P. Z. S., 1898, p. 372; Aurivillius, *t. c.*, p. 330, 1898.

a. Gan Liban, 5000 feet; 22nd March, 1899.

16. *TARUCUS THEOPHRASTUS*.—*Lycæna theophrastus* (Fabr.),

E. M. Sharpe, P. Z. S., 1896, p. 533. *Tarucus theophrastus*, E. M. Sharpe, P. Z. S., 1896, p. 525; *id. t. c.*, 1898, p. 370. *Tarucus theophrastus*, Fabr., var. *sybaris*, Butler, P. Z. S., 1897, p. 693. *Cupido theophrastus*, Aurivillius, *t. c.*, p. 363 (1898).

a. ♀. Biji; 15th Jan., 1899.

17. TARUCUS TELICANUS, Lang.—*Lycæna pulchra*, Murray, E. M. Sharpe, P. Z. S., 1896, p. 533. *Tarucus plinius* (Fabr.), Butler, P. Z. S., 1897, p. 693. *Cupido telicanus*, Aurivillius, *t. c.*, p. 364 (1898).

a.-b. ♂. Biji; 10th, 15th Jan., 1899.

18. POLYOMMATUS BÆTICUS.—*Lycæna bætica* (Linn.), E. M. Sharpe, P. Z. S., 1896, p. 533; *id. t. c.*, 1896, p. 525. *Polyommatus bæticus*, Butler, P. Z. S., 1897, p. 692; Dixey, P. Z. S., 1900, p. 13. *Cupido bæticus*, Aurivillius, *t. c.*, p. 367 (1898).

a.-b. ♂. Biji; 12th, 13th Jan., 1899.

c. ♂. Laskarato; 28th Jan., 1899.

19. PLEBEIUS TROCHILUS.—*Lycæna trochilus*, Frey., E. M. Sharpe, P. Z. S., 1896, p. 525; *id. t. c.*, 1898, p. 370. *Plebeius trochilus*, Dixey, P. Z. S., 1900, p. 13. *Cupido trochilus*, Aurivillius, *t. c.*, p. 376 (1898).

a. Biji; 10th Jan., 1899.

Family PIERIDÆ.

20. MYLOTHRIS AGATHINA.—*Mylothris agathina* (Cram.), E. M. Sharpe, P. Z. S., 1896, p. 534; *id. t. c.*, 1896, p. 526; *id. t. c.*, 1898, p. 370; Aurivillius, *t. c.*, p. 394 (1898); Dixey, P. Z. S., 1900, p. 17.

a. ♀. Gan Liban; 31st March, 1899.

21. BELENOIS MESENTINA.—*Pieris lordaca* (Walker), E. M. Sharpe, P. Z. S., 1896, p. 534. *Pieris mesentina* (Cram.), Aurivillius, *t. c.*, p. 407 (1898). *Belenois mesentina*, Dixey, P. Z. S., 1900, p. 17.

a. ♂. Bihen Dula; 24th Dec., 1898.

22. SYNCHLOE GLAUCONOME.—*Synchloe glauconome* (Klug), E. M. Sharpe, P. Z. S., 1896, p. 536; *id. t. c.*, 1896, p. 528; *id. t. c.*, 1898, p. 371. *Pieris glauconome*, Aurivillius, *t. c.*, p. 414 (1898).

a. ♂. Biji; 15th Jan., 1899.

b. ♀. Bihen Dula; 24th Dec., 1898.

23. TERACOLUS CALAIS.—*Teracolus calais* (Cram.), E. M. Sharpe, P. Z. S., 1896, p. 535; *id. t. c.*, 1896, p. 527; *id. t. c.*, 1898, p. 370; *id.*, Monogr. *Teracolus*, p. 1 (1898). *Teracolus amatus*, Aurivillius (part), *t. c.*, p. 422 (1898).

a.-c. ♂. Biji; 12th, 13th Jan., 1899.

d. ♂. Laskarato; 25th Jan., 1899.

24. TERACOLUS PHISADIA.—*Teracolus arne* (Klug), E. M.

Sharpe, P. Z. S., 1896, p. 527; *id. t. c.*, 1898, p. 370. *Teracolus phisadia* (Godt.), E. M. Sharpe, Monogr. *Teracolus*, p. 12 (1898); Aurivillius, *t. c.*, p. 423 (1898).

a.-c. ♂. Bihen Dula; 24th Dec., 1898.

d.-g. ♂ ♀. Biji; 10th, 13th, 16th Jan., 1899.

25. *TERACOLUS CASTALIS*.—*Idmais castalis*, Staud., E. M. Sharpe, P. Z. S., 1896, p. 526. *Teracolus vestalis*, Butler, Aurivillius (part.), *t. c.*, p. 423 (1898). *Teracolus castalis*, E. M. Sharpe, Monogr. *Teracolus*, p. 19 (1898).

a. ♂. Laskarato.

26. *TERACOLUS CHRYSONOME*.—*Teracolus chrysonome* (Klug), E. M. Sharpe, P. Z. S., 1896, p. 535; *id. t. c.*, 1896, p. 527; *id. t. c.*, 1898, p. 370; Aurivillius, *t. c.*, p. 424 (1898).

a.-b. ♂ ♀. Near Laskarato, 3000 feet; 21st Jan., 1899.

c.-d. ♂ ♀. Bihen Dula; 24th Dec., 1898.

27. *TERACOLUS LEO*.—*Teracolus leo*, Butler, E. M. Sharpe, P. Z. S., 1896, p. 536; *id. t. c.*, 1896, p. 528. *Teracolus halimede*, Klug., Aurivillius (part), p. 426 (1898).

a. ♂. Biji; 13th Jan., 1899.

28. *TERACOLUS HELIOCAUSTUS*.—*Teracolus heliocaustus*, Butler, E. M. Sharpe, P. Z. S., 1896, p. 536; Butler, P. Z. S., 1897, p. 693; E. M. Sharpe, P. Z. S., 1898, p. 370; Dixey, P. Z. S., 1900, p. 15. *Teracolus pleione*, Klug., Aurivillius (part), *t. c.*, p. 426 (1898).

a. ♂. Robussa, Haud; 12th March, 1898.

29. *TERACOLUS PROTOMEDIA*.—*Teracolus protomedia* (Klug), E. M. Sharpe, P. Z. S., 1896, p. 535; *id. t. c.*, 1896, p. 527; Butler, P. Z. S., 1897, p. 693; E. M. Sharpe, P. Z. S., 1898, p. 371; Aurivillius, *t. c.*, p. 427 (1898); Dixey, P. Z. S., 1900, p. 15.

a.-b. ♂ ♀. Biji; 11th, 13th Jan., 1899.

30. *TERACOLUS EUPOMPE*.—*Teracolus eupompe*, Klug, E. M. Sharpe, P. Z. S., 1898, p. 370; Aurivillius, *t. c.*, p. 432 (1898); Dixey, P. Z. S., 1900, p. 14.

a. ♂. Ania, 5000 feet; 1st Feb., 1899.

b. ♂. Ania; 6th Feb., 1899.

31. *TERACOLUS DAIRA*.—*Teracolus दौरा* (Klug), Butler, Ann. and Mag. Nat. Hist. (6), xx, p. 459 (1897); Aurivillius, *t. c.*, p. 435 (1898).

a.-b. ♂ ♀. Biji; 13th, 15th Jan., 1899.

c.-d. ♂. Ujawaji; 29th Jan., 1899.

32. *TERACOLUS XANTHUS*.—*Teracolus xanthus*, Swinh., Butler, P. Z. S., 1897, p. 693; *id.*, Ann. and Mag. Nat. Hist. (6), xx, p. 462 (1897).

a. ♂. Ania; 6th Feb., 1899.

33. *TERACOLUS CASTA*.—*Teracolus casta*, Gerst., Butler, P. Z. S.,

1897, p. 693; *id.*, Ann. and Mag. Nat. Hist. (6), xx. p. 464 (1897).
a.-b. ♂ ♀. Gaukabibeh, 3000 feet; 21st Jan., 1899.

34. TERACOLUS PHILLIPSI.—*Teracolus phillipsii*, Butler, P. Z. S., 1896, p. 536; *id. t. c.*, 1896, p. 528; *id. t. c.*, 1898, p. 370; E. M. Sharpe, Monogr. Teracolus, p. 95, 1900; Dixey, P. Z. S., 1900, p. 15.

a. ♂. Biji; 13th Jan., 1899.

b. ♂. Near Laskarato, 3000 feet; 21st Jan., 1899.

c. ♀. Laskarato; 25th Jan., 1899.

35. ERONIA BUQUETI.—*Eronia buqueti* (Boisd.), Aurivillius, *t. c.*, p. 447 (1898).

a. ♂. Biji; 16th Jan., 1899.

b. ♂. Near Laskarato, 3000 feet; 21st Jan., 1899.

c. ♂. Laskarato.

36. CATOPSILIA FLORELLA.—*Catopsilia florella* (Fabr.), E. M. Sharpe, P. Z. S., 1896, p. 536; *id. t. c.*, 1896, p. 528; Butler, P. Z. S., 1897, p. 693; E. M. Sharpe, P. Z. S., 1898, p. 371; Aurivillius, *t. c.*, p. 449 (1898); Dixey, P. Z. S., 1900, p. 14.

a. ♂. Biji; 12th Jan., 1899.

37. TERIAS HAPALE.—*Terias hapale*, Mab., Aurivillius, *t. c.*, p. 452 (1898); Dixey, P. Z. S., 1900, p. 14.

a.-b. Biji; 12th, 15th Jan., 1899.

Family PAPILIONIDÆ.

38. PAPILIO DEMODOCUS.—*Papilio demodocus*, Esper; Aurivillius, *t. c.*, p. 477 (1898). *Papilio demoleus*, Linn.; E. M. Sharpe, P. Z. S., 1896, p. 536; *id. t. c.*, 1896, p. 528; Butler, P. Z. S., 1897, p. 693; E. M. Sharpe, P. Z. S., 1898, p. 371; Dixey, P. Z. S., 1900, p. 17.

a. Near Laskarato, 3000 feet; 21st Jan., 1899.

Family HESPERIDÆ.

39. PARNARA MATHIAS.—*Parnara mathias*, Fabr.; Watson, P. Z. S., 1893, p. 105.

a. Biji; 15th Jan., 1899.

40. SARANGESA ELIMINATA.—*Sarangesa eliminata*, Holland; P. Z. S., 1896, p. 9; Dixey, P. Z. S., 1900, p. 17.

a. Biji; 15th Jan., 1899.

b.-c. Mandera; 4th April, 1899.

41. GOMALIA ALBOFASCIATA.—*Gomalia albofasciata*, Moore; Watson, P. Z. S., 1893, p. 67.

a. Biji; 4th Jan., 1899.

HETEROCERA.

Family NOCTUIDÆ.

1. SPHINGOMORPHA MONTEIRONIS.—*Sphingomorpha monteironis*, Butler, Ann. and Mag. Nat. Hist. (4), xvi. p. 406.
 - a. Bihen Dula; 25th Dec., 1898.
 - b. Near Laskarato, 3000 feet.
 - c. Silai; 8th Jan., 1899.
2. OPHIUSA MELICERTA.—*Noctua melicerta*, Drury, Ill. Exot. Ins. vol. i. pl. xxiii. fig. 1 (1773).
 - a. Silai; 8th Jan., 1899.
3. HYPENA LIVIDALIS.—*Hypena lividalis*, Hübn.; Hampson, 'Fauna British India,' iii. p. 80 (1895).
 - a. Biji; 15 Jan., 1899.
4. CEROCALA ILLUSTRATA.—*Cerocala illustrata*, Holland, in Donaldson Smith's 'Through Unknown African Countries,' App. p. 417, 1897.
 - a.-b. Ania; 3rd Feb., 1899.

Family NOTODONTIDÆ.

5. Sp.
 - a. Ania; 4th Feb., 1899.

Family SYNTOMIDÆ.

6. SYNTOMIS TOMASINA.—*Syntomis tomasina*, Butler, P. Z. S., 1897, p. 693.
 - a. Robussa, Haud; 12th March, 1898.

COLEOPTERA.

Family CARABIDÆ.

1. POLYHIRMA CALLIAUDA.—*Polyhirma calliauda*, Castlenau, etud. Ent., 1835, p. 150.
 - a. Adadlek; 19th March, 1899.

Family BUPRESTIDÆ.

2. AMBLYSTERNA LATICOLLIS.—*Julodis laticollis*, Gahan, P. Z. S., 1900, p. 25.

Family MELYRIDÆ.

3. MELYRIS LIMBIFERA.—*Melyris limbifera*, Ancey, Le Nat., ii. p. 62 (1882).

Family BOSTRICHIDÆ.

4. APATE TEREBRANS.—*Apate terebrans*, Pallas, Spic. Zool. Ins. Fasc., ix. p. 7, t. 1, f. 3 (1772).
 a. Gan Liban; 23rd Feb., 1899.

Family TENEBRIONIDÆ.

5. ZOPHOSIS sp.
 6. ZOPHOSIS sp.

Family LAMIIDÆ.

7. CERATITES JASPIDEUS.—*Ceratites jaspideus*, Serv. Ann. Fr., 1835, p. 35.
 a. Gan Liban, 4700 feet; 27th Feb., 1899.
 8. CEROPLESIS REVOILI.—*Ceroplesis revoili*, Fairm.; Révoil, 'Faune et Flore de Pays Comalis,' p. 100 (1882).

NEUROPTERA.

Family LIBELLULIDÆ.

1. PANTALA FLAVESCENS.—*Pantala flavescens*, Fabr. Ent. Syst. Suppl., p. 285 (1798).
 Six specimens. Bulhar; 4th Jan., 1899.
 2. CROCOTHEMIS ERYTHRÆA.—*Crocothemis erythræa*, Brullé, Expéd. de Morée, iii. (1), p. 102, pl. 32, f. 4 (1832).
 Two specimens. Bulhar; 4th Jan., 1899.

ORTHOPTERA.

Family BLATTIDÆ.

1. BLATTA sp.

Family GRYLLIDÆ.

2. ACHETA BIMACULATA.—*Gryllus bimaculata*, De Geer, Ins. iii. 338, pl. 43, f. 1 (1773).
 a. Gan Liban, 5900 feet; 23rd March, 1899.
 3. PHÆOPHILACRIS sp.

Family LOCUSTIDÆ.

4. PHYMATEUS sp.
 a. Gan Liban, 5900 feet; 22nd March, 1899.
 5. PÆCILOCERA VITTATA.—*Decticus vittatus*, (Klug), Symb. Phys. Dec. iii. pl. 25, figs. 6, 7 (1832).
 6. ACRIDIUM PEREGRINUM.—*Acridium peregrinum*, Olivier, Voy. Emp. Othom. iv. p. 388 (1804).
 a. Biji; 20th Jan., 1899.
 7. CHROTOGONUS ? HEMIPTERUS. — *Chrotogonus hemipterus*, Schaum., Monatsbr. Berl. Acad., 1853, p. 780.

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ON NAMES APPLIED TO CERTAIN SPECIES OF THE PIERID GENUS *CATASTICTA*.

BY ARTHUR G. BUTLER, Ph.D., &c.

IN 1897 the late Dr. Otto Staudinger wrote to inform me that he was meditating upon the publication of a Revision of the genus *Catasticta*, and he asked me to let him have papers published by me in which species of that genus were described.

Although I cannot discover that the proposed Revision was ever published, certain names proposed by Dr. Staudinger have become well known amongst dealers, and specimens are being sold broadcast, under these names, to the entomological public.

It was an unfortunate fact that the late Dr. Staudinger, whose care in the determination of Palæarctic Lepidoptera earned him a world-wide reputation, was, unfortunately, by no means so careful when dealing with exotic species. In the case of *Catasticta* he has given manuscript names to several species without taking the least trouble to ascertain whether or not his supposed new species are identical with those long previously described from the same localities.

As it is most important that Staudinger's proposed names should not be accepted without examination, and the species described as new to science, I propose to state what they are (so far as I have hitherto come in contact with them), and, if new, I shall adopt his name and describe.

I have met with the following in the Crowley collection:—

1. *ARCHONIAS PHILEMON*, Staudinger; from Bolivia.—This is typical *Catasticta colla*, Doubleday, from Bolivia.

2. *ARCHONIAS CORNELIA*, Staudinger; from Bogota.—This is typical *Catasticta hebra*, Lucas; from Colombia.

3. *ARCHONIAS OPPOSITA*, Staudinger, from Bolivia.—This is typical *Catasticta manco*, Doubleday; from Bolivia.

4. *ARCHONIAS HOPFFERI*, Staudinger; from Bolivia.—This is typical *Catasticta pinara*, Doubleday; from Bolivia.

6. *ARCHONIAS JACINTA*, Staudinger; from Bolivia.—This is a new species, near to *Catasticta chelidonis*, Hopffer.

7. *ARCHONIAS TAMINA*, Staudinger; from Manizales, Orinoco, &c.—This is typical *Catasticta tomyris*, Felder; from Bogota.

It seems probable that this species was confused, by the late Dr. Staudinger, with *Catasticta toca*; both species occur in Bolivia.

I may add a note upon a species described by Mr. Mengel under the name of *Archonias xequé*. The latter is typical *Catasticta chrysolopha*, Kollar.

The following new species from the Crowley collection may be described:—

CATASTICTA CROWLEYI, sp. n.

Intermediate, in some respects, between *C. potamea* and *C. strigosa* (= *actinotis* ♂), the pattern of the upper surface being that of the latter species, excepting that the discal series of five spots on the secondaries is clearly defined and separate from the pale basal area; upper surface dark purplish brown, with the pale areas and spots whitish ash (bone-white, irrorated with blackish when seen through a lens); the outer border of the secondaries and the veins being thus very sharply defined; an orange spot on each side of the collar; under surface much the same as in *C. actinotis* ♂, but the secondaries of a paler lilacine brownish tint, with no defined central dark belt, the yellow spots only being attached to dark brown hastate markings; expanse of wings, 55–58 mm.

Monte Sierra and Culata, Venezuela. (Three males.)

My *C. strigosa* was described from a Peruvian example, which differs slightly from those since received from Central America; but there can be no doubt that these discrepancies are not of specific value when one has an opportunity of comparing them in the insects themselves; the greenish tint of *C. actinotis*, male, is very characteristic, and separates it at a glance from the brownish *C. potamea*, the white-marked *C. hebra*, and the whitish ash-marked *C. crowleyi*.

CATASTICTA JACINTA, sp. n.

Archonias jacinta, Staudinger, in litt.

Closely related to *C. chelidonis* and *C. zancle* (= *C. cora* ?); nearer to the latter, from which it chiefly differs in the slightly narrower ochreous belt across the primaries, the smaller double spot in the angle of the discoidal cell, the more widely blackened veins, the broader blackish base to the secondaries, and the consequently narrower ochreous belt crossed by black veins. The ochreous markings above are also of a more creamy (less orange) tint than in *C. chelidonis*. On the under surface the basal area of the primaries is broadly smoky brown; all the yellow markings are clearer, more lemon-tinted; the veins are blacker, the submarginal lunules on the

primaries less elongated: otherwise the two species are similar. Expanse of wings, 53-56 mm.

Bolivia. (Three males.)

CATASTICTA APATURINA, sp. n.

Nearly allied to *C. toca*, but the primaries produced and sub-angulated, the secondaries subtriangular with elongated anal angle (giving this species much the outline of some of the species of *Apatura*). The upper surface sooty black, with white markings irrorated with black, arranged nearly as in *C. chrysolopha*, but the outer row of white spots small and ill-defined on the primaries and almost obliterated on the secondaries; the secondaries are marked more nearly as in *C. toca*, the band being wholly white, but narrower and distinctly divided at the median vein in the males; the colouring of the under surface is nearly as in *C. toca*, but distinctly yellower and brighter; the trident-like marking at the base of the radial and median veins on the secondaries is larger, better connected, and of an ashy slate-colour, completely enclosing three small yellow spots. Expanse of wings, 47 mm.

Angamarca, Ecuador. (Two males, one female.)

LEPIDOPTERA IN CENTRAL GERMANY.

By J. JÄGER.

IN the 'Entomologist' for January, 1892, appeared an article of mine, with a short geographical description of the small town of Biedenkopf on the Lahn, in Hessen-Nassau, and its surroundings, including a list of Rhopalocera found by me during August of the preceding summer. After an interval of ten years I have once more paid a visit to this charming spot, and, as it happened, I met my nephew, Mr. Richard Werner (of the firm Siemens and Halske, Berlin), also a zealous entomologist, spending his summer holiday there. On our daily walks in the midst of lovely mountain scenery we came in contact with a profusion of insect life, chiefly Rhopalocera, a list of which, seen and captured on the morning of Aug. 9th, I will here enumerate:—*Papilio machaon*, common principally in clover fields. *Pieris brassicae*, *P. napi*, and *P. rapae*, all very common. *Leucophasia sinapis*, sparingly. *Colias hyale*, very common. *Gonopteryx rhamni*, very common. *Argynnis selene*, very common. *A. latonia* and *A. dia*, common. *A. paphia* and *A. adippe*, in great numbers. *A. aglaia*, few and worn. *Vanessa urticae* and *V. io*, common. *V. polychloros* and *V. c-album*, a few specimens. *Vanessa atalanta*, just appearing. *V. antiopa*, common near orchards. Our captures of this species amount to about forty altogether. *Melanargia galathea*, common, but worn. *Erebia*

medea and *E. ligea*, very common. *Pararge egeria* and *P. megæra*, a few specimens, common. *Satyrus semele*, a few specimens. *Epinephele ianira*, very common. *Cænonympha pamphilus*, very common. *C. arcania*, a few specimens. *Thecla betulae*, a few specimens. *Polyommatus virgaureæ*, common, but worn. *P. dorilis*, common. *P. phlœas*, fairly common. *Syrichthus malvæ* and *S. alveolus*, a few specimens. *Hesperia comma*, very common. *Lycæna icarus*, very common. *L. astrarche*, common.

Among the day-flying Geometridæ *Ortholitha mœniaria* and *Fidonia brunneata* were most common, whilst the Zygaenidæ were represented by two or three species, of which *Z. pilosellæ* was the most prominent.

Of the Pyralides, *Spilodes palealis* was frequently met with.

Before my arrival the following species were captured:—*Apatura iris*, very common in the mountain paths (latest July 23rd), estimated captures from eighty to ninety; also several specimens of *A. ilia* and the var. *clytie*. *Limenitis populi*, about June 23rd, several specimens. *Satyrus circe* (*proserpina*) and *S. briseis*; *Vanessa prorsa*; *Aporia cratægi*.

At the soapwort (*Saponaria officinalis*) growing on the banks of the river the following Sphingidæ were taken nightly:—*S. pinastri*, *S. convolvuli* (from July 13th to October, about 120 specimens), *Deilephila euphorbiæ* (about eighty), *Chærocampa elpenor*, *C. porcellus*.

After an absence of five weeks I returned again to Biedenkopf on Sept. 30th; during this interval an unusual number of *Catocala fraxini* (about 200) and a few *C. nupta* had been taken from ash-trees in an avenue near the town, the time of appearance extending from Aug. 25th to Sept. 28th. With the exception of a few additional buildings, I found the place very little altered since 1891; but there is a new and charmingly situated hotel (Berggarten) on a mountain slope overlooking the river and town, at which board and lodging (*en pension*) can be obtained at the rate of four to five shillings per day). From a verandah in front I have spent many hours watching the elegant flight of *V. antiopa*, which used to resort to a willow-stump, the sap of which seemed even more attractive to them than the pears and plums on the neighbouring trees.

In conclusion, I may mention that, beyond visiting the honey-suckle and soapwort near the river at dusk, Heterocera have never been worked for in this district, sugaring and other methods being comparatively unknown. I therefore think that, if the neighbourhood were systematically worked, some good results might be obtained. I shall be pleased to give further information to any one who may desire it.

FOUR MONTHS' COLLECTING IN THE ISLE OF LEWIS.

Mr. McArthur, whose return from a four months' expedition to the Isle of Lewis we announced last month (*ante*, p. 288), has again been successful in adding to our knowledge of the lepidopterous fauna of that part of Great Britain, but, as was naturally to be expected, not to the same extent that he did in 1887. Altogether, the increment amounts to seventeen species, but of several of these only one or two examples were obtained. The additions to the list published in the 'Entomologist' for 1888 (xxi. 25-27) are—*Vanessa urticæ*, *Macroglossa stellatarum*, *Noto-donta dromedarius*, *Stilbia anomala*, *Acosmetia caliginosa*, *Agrotis simulans*, *Noctua augur*, *Triphæna janthina*, *Pachnobia rubricosa*, *Tæniocampa gothica*, *T. stabilis*, *Hadena rectilinea*, *Cucullia verbasci*, *Plusia iota*, *Udaria miata*, *Carsia paludata* (one), *Euchromia arbutella*.

Some species that were abundant in 1887 were not seen at all this year. *Bombyx rubi*, for example, was in swarms all over the island on Mr. McArthur's previous visit, but he did not observe even one on this occasion. On the other hand, *Dicranura vinula*, of which species only one specimen had been previously met with, was fairly common, both as imagines and larvæ.

Hadena rectilinea was represented by two female examples, both larger and darker than those occurring on the mainland. A fine batch of ova was obtained from one of the females, and the larvæ resulting therefrom were fed up on sallow. Unfortunately, just when full grown, they all, some two hundred odd in number, died within four days.

Vanessa urticæ was seen in considerable numbers during the spring on Eye peninsula, but these were left to perpetuate their kind. Later on in the season, three journeys were made to the locality, with the view of finding larvæ of the species, but without success. A fourth trip, however, resulted in the capture of two imagines, which, from their fine condition, had not long emerged, left no doubt that larvæ had fed up there.

Lycæna icarus.—Some of the males have black dots on the outer margins of the hind wings (upper surface), and the proportion of such specimens is, perhaps, greater than was the case in 1887.

Hepialus humuli.—In the course of his observations on the habits of this species, Mr. McArthur noted that the males, after having attracted the females and paired, fly around tree tops and the upper ridges of the cliffs, &c. The specimens were quite normal.

Agrotis cursoria.—The Shetland form of this species occurs in Lewis, but not in Orkney.

Noctua brunnea.—All the specimens have a beautiful violet tinge.

Apamea basilinea.—One example without markings was secured.

Boarmia repandata.—The local form of this species, var. *sodorensium*, Weir, is well represented, and the specimens are unusually fine.

Odontopera bidentata.—The series obtained this year are an interesting lot. In colour they range through all gradations, from very pale ochreous to almost black. The markings in some specimens are exceedingly well defined, and in others obsolete.

Emmelesia albulata.—The var. *hebridium* was not seen in its true form, and only one example of the species captured this season approximated thereto.

Melanippe sociata var. *obscurata*.—Specimens of the second generation are tinged with ochreous, whilst those of the first generation are larger, darker in marking, and without any ochreous in the coloration.

Triphæna comes (*orbona*) occurs in all forms, including var. *curtisii*, whereas in Orkney only the latter form and its modifications have been obtained.

The collection, taken as a whole, is of greater value and interest than that brought back in 1887. We understand that the weather, from the beginning of May until the middle of June, was all that a collector could desire, but from the latter date up to the middle of July it was very unsettled. Sugar was not attractive, the only visitors being a few *Xylophasia monoglypha* (*polyodon*) and *Triphæna pronuba*.

VARIATION IN THE GENUS *EREBIA*.

BY GEOFFREY SMITH.

PART I.

(Continued from p. 281.)

WE have seen that when a scheme of distribution is normal—*i.e.* when about the same number of individuals have values above the normal as below—then M, or the medium obtained by the scheme and the arithmetical mean of the values under observation are practically identical (see note, p. 280). So far, then, there is no apparent advantage gained by throwing the numbers in Tables I. and II. into the form of a scheme.

The advantage lies here: when it is stated that, for instance, ten individuals have 4 spots apiece; the mere numbers imply absolute identity between those ten individuals with regard to those spots. But this is never quite the case in nature; it would be giving a totally incorrect idea of the variations in the spots and ocelli of different species of *Erebia*, if hard and fast

lines were drawn between the various individuals of a species according as they had 0, 1, 2, 3, &c., spots. In order to give any idea of this variability, the relative sizes, distribution, &c., of those spots would have to be described. Now, this is done roughly by means of the scheme; when the statement that ten individuals have 4 spots apiece is transcribed into the scheme, all that is said about these individuals is that each one of them has a "spot-power" somewhere above 3 and up to 4—*e.g.* 3.1, 3.5, 3.7, &c. In this way the variations in size, &c., of the spots is taken into account, without actually measuring the individuals separately, except in so far as they have 0, 1, 2, 3, &c., spots of some kind.

How far it is possible to treat wing patterns in this manner can only be decided when actual data are considered; but it is obvious that in other characters, such as length of wing, weight, &c., the method is invaluable. For, instead of having to measure or weigh each individual accurately, convenient ordinal numbers are chosen, and the individuals are grouped according as they exceed or fall short of those numbers with regard to the character to be considered.

By means of this scheme, then, we are able to determine the M or mid-value of a group of individuals with regard to some character or other. The properties of this M are, besides its relation to the arithmetical mean—(1) the chance is an equal one of any previously unknown measure in the group exceeding or falling short of M; (2) the most probable value of any unknown measure in the group is M.

From these properties we gather that if individuals are selected *at random* from a group, the M of the smaller group so formed tends to remain the same as the original M of the whole group. In nature a chance selection must always be made, apart from natural or sexual selection, to determine which individuals shall breed: since these individuals in each generation will be selected according to the laws of chance, we may treat every generation as breeding in terms of its M.

In this way we bring our numbers under the light of the laws of chance, and it is under this light especially that it is intended here to bring the phenomena to be considered.

It is now time to answer an objection that will probably have occurred to the reader with regard to the discussion of fig. 1 on p. 279. It was there stated that if there were only a very few females, these would receive mates *by chance*, and so the equilibrium would be thrown out of order. But we have just seen that a selection of mates is always made *by chance*, and on this is based our system of dealing with the numbers; so that it would seem that in the case of the females being in a minority, there would be an equal chance of an equilibrium being established. But the word chance is used here in two different senses. In

the first case, where the females are in a great minority, only a very small selection of males is made for pairing, and the laws of chance cannot be applied to very small selections.

Make up, for instance, a pack of cards with 52 red and 26 black. The chances are then 2 to 1 on any card being red. Try to verify these chances, first by selecting at random 3 cards, and noting down their colours; repeat this process several times, putting back and shuffling the three cards after each draw. Then try with larger and larger selections in the same manner, and see which give the nearest result to the proportion 3 red to 1 black on the total number of draws. If this does not satisfy, the experiment may be tried with more complicated proportions. With more complicated proportions, larger draws are required, and so on. It is to a similar principle that a gambling establishment like Monticarlo owes its continued existence.

Some way back (p. 280) the principle was formulated that equality in the number of the sexes tended towards equilibrium, and that inequality tended towards fluctuation of characters. To illustrate this, an hypothetical case was taken (1) in which the males were variable and the females constant, the males being in excess. It is plain that several other conditions might occur. Thus (2) males variable, females constant, females in excess; (3) males constant, females variable, males in excess; (4) males constant, females variable, females in excess; (5) males variable, females variable, males in excess; (6) males variable, females variable, females in excess. By a little consideration it will be seen that conditions (2) and (3) are favourable to an equilibrium being established, and therefore do not fall in with the principle, and that (1), (4), (5), and (6) are conditions favourable to fluctuation. The second clause of the principle formulated must therefore be narrowed to the following—"and that inequality when coupled with variability in the preponderating sex tends towards fluctuation."

(To be continued.)

NOTES ON THE DIVISION VELIARIA [RHYNCHOTA]

(=SUBFAM. VELIDÆ, LETH. & SEV.).

BY G. W. KIRKALDY, F.E.S.

(Continued from p. 286.)

The following table of species is to some extent based upon Champion's table of Central American species; I have, however, seen specimens of most of the described species:—

- | | |
|--|----------------------------|
| 1. Posterior tibiæ with a long hook at the apex. | |
| [Posterior femora, moderately incrassate, dentate] | 2 |
| 1 a. Posterior tibiæ without a hook | 4 |
| 2. Terminal genital segment mucronate | 1 <i>uncinata</i> , Champ. |

- 2a. Terminal genital segment not mucronate 3
3. Pronotum fuscous; legs moderately long 2 *elegans*, Uhler.
- 3a. Pronotum rufo-castaneous, legs shorter 3 *insularis*, Champ.
4. Posterior femora unarmed ♂ ♀ 5
- 4a. Posterior femora dentate beneath ♂ ♀ 6
5. Mesosternum with a strong, curved diagonal carina 4 *festæ*, Kirk.
- 5a. Mesosternum simple 5 *plumbea*, Uhler.
6. Posterior femora more or less incrassate (at least in the ♂) 7
- 6a. Posterior femora scarcely incrassate 20
7. Intermediate femora constricted medianly; posterior femora (♀) hollowed at the base, and dentate in their outer half; posterior tibiæ obsoletely denticulate 6 *spinigera*, Champ.
- 7a. Intermediate femora not constricted 8
8. Posterior femora greatly incrassate and dentate, posterior tibiæ conspicuously denticulate (♂) 9
- 8a. Posterior femora moderately incrassate and dentate, posterior tibiæ nearly straight and minutely denticulate (♂) 16
9. Posterior legs subelongate; tibiæ strongly sinuous (♂). 10
- 9a. Posterior tibiæ straight; armed with two long teeth (♂). 14
10. Anterior tibiæ not dilated (♂) 11
- 10a. Anterior tibiæ greatly dilated and excavate beneath (♂). 7 *collaris* (Burm.)
11. Posterior femora strongly incrassate and multidentate, posterior tibiæ armed with slightly longer teeth beyond the middle (♂) 8 *varipes*, Champ.
- 11a. Posterior femora enormously inflated and multidentate 12
12. Posterior trochanters with a long spine 9 *whitei* (Bredd.)
- 12a. Posterior trochanters obsoletely (or not) dentate 13
13. Ultimate segment of intermediate tarsi much longer than the second 10 *ravana*, sp. nov.
- 13a. Ultimate segment slightly longer than the second 11 *crassipes*, Champ.
14. Third segment of antennæ and the anterior tibiæ dilated (especially ♂) 12 *tayloriella*, Kirk.
- 14a. Third segment of antennæ and anterior tibiæ not dilated 15
15. Length more than 5 mill., a castaneous median longitudinal line (at least) on pronotum. Seventh segment of connexivum produced apically in acute spines 13 *reitteri*, Reuter.
- 15a. Length less than $4\frac{1}{2}$ mill., pronotum unicolorous (except for transverse apical stripe). Connexivum not spinose 14 *femoralis*, Champ.
16. Posterior femora moderately incrassate (♂), slender (♀); entirely dark (except base of median tooth) 17
- 16a. Posterior femora moderately incrassate (♂ ♀); flavous at the base and beneath 18
17. Second segment of intermediate tarsi equal to third 15 *distincta*, Champ.
- 17a. Second segment one-fifth shorter than third 16 *peggiæ*, Kirk.

18. Second and third segments of intermediate tarsi sub-equal. (Pronotum in the macropterous form, apically spinose) 17 *armata* (Burm.)
- 18a. Third segment distinctly longer than second 19
19. More than three times as long as broad; (pronotum in macropterous form not spinose) ground colour of legs deep black 18 *nigricans* (Burm.)
- 19a. Less than two and a half times as long as broad; ground colour of legs fulvous 19 *salinus* (Champ.)
20. Second and third segments of intermediate tarsi sub-equal 20 *angustipes*, Uhl.
- 20a. Second segment much longer than third 21 *tenuipes*, Champ.

Species not included in the above table:—

- No. 22. *obesa*, Uhler.
 „ 23. *aneipes*, Haglund.
 „ 24. *infernalis* (Butler).
 „ 25. *trailii* (F. B. White).

(To be continued.)

NOTES AND OBSERVATIONS.

SECOND BROOD OF *EPINEPHELE IANIRA*. — With reference to Mr. Lucas's note on this subject (*ante*, p. 287), I am inclined to think that a late emergence of *Epinephele ianira* is the rule rather than the exception in the more sheltered parts of the south coast. Whether we are right in attributing it to the occurrence of a second brood is perhaps open to question, although I must say that such little evidence as is obtainable is favourable to that presumption. One is far too apt to omit from one's note-book all mention of a species generally regarded as "so common," and as a consequence reliable records regarding its times of appearance are few; but such casual notes as I have been able to turn up go to support my recollection that it has generally occurred fairly plentifully in the sheltered hollows under Beachy Head, where I have collected more or less regularly for many years well into the end of August. My first visit to that locality during the past summer was on August 19th; *E. ianira* was then flying commonly, and continued on the wing in varying abundance, according to the suitability of the weather, until I left the neighbourhood on September 15th; and a pair that I captured on the 8th of that month are in perfectly fresh condition—a fact, the full significance of which will be appreciated when it is mentioned that a strong gale swept the coast on the 3rd and 4th.—ROBT. ADKIN; Lewisham, October, 1901.

PTEROSTOMA PALPINA DOUBLE-BROODED. — I do not think the appearance of a second brood of *P. palpina*, with full-sized imagines, can be so unusual, in the South of England, as Mr. A. J. Lawrance seems to think (*vide ante*, p. 288). Of the seventeen male specimens before me, collected from various sources, by far the largest one of all was taken

by myself in this neighbourhood on August 20th, 1892; whilst of the three next in point of size, one was captured at Seale, Surrey, by the Rev. C. R. Digby on August 23rd, 1892, and another in this neighbourhood by myself on August 24th, 1886. Curiously enough, these three August specimens are the only ones out of the seventeen males of which the actual dates of capture are known to me, and the two of them that fell to me are the only examples of *P. palpina* that I have ever taken. — EUSTACE R. BANKES; Norden, Corfe Castle, October 22nd.

Referring to Mr. A. J. Lawrance's note (*ante*, p. 288) on the appearance of a second brood of *P. palpina*, I may mention that I captured five perfect specimens of this moth at light between the 8th and 12th August last. These, I think, were undoubtedly specimens of a second brood. — PHILIP J. BARRAUD; Bushey Heath, Herts.

With reference to Mr. A. J. Lawrance's note in last month's 'Entomologist,' I beg to say that this species appears to be constantly double-brooded. In this neighbourhood I usually see full-grown larvæ at the end of June or beginning of July, and again in September, and whenever I breed it I always find it double-brooded. This was also my experience some years ago in Devonshire. It is a favourite species of mine, and I have bred great numbers of them at different times. — GERVASE F. MATHEW; Dovercourt, Essex, October 17th, 1901.

PACHYCNEMIA HIPPOCASTANARIA DOUBLE-BROODED. — In answer to Mr. Carr's query regarding a late emergence of *P. hippocastanaria* (*ante*, 288), I find, on reference to my note-books, that it occurred pretty freely on Shirley Heath, Surrey, in the seventies, both in April (the usual date being about the 20th of that month) and in August; also that from larvæ swept from heather in the same locality in September, I reared moths in the following January and February, and from others taken in the same way and place in June moths appeared in July, the pupæ in both cases being kept indoors in a fairly warm room. In later years I have met with the imago in some numbers at Oxshott both in April and August. As my notes extend over a number of years, I think the late brood cannot be regarded as in any way exceptional. — ROBERT ADKIN; Lewisham, October, 1901.

Perhaps my experience as to *P. hippocastanaria* being regularly double-brooded may be of interest to Mr. Carr and others. Before 1899 I cannot speak with certainty, as I did not at that time keep a diary of the occurrence of the more common species; but in both 1899 and 1900 I found it fairly abundant in July and the earlier part of August on our *Cribrum* heaths here whilst in search of *Selidosema ericetaria* and *Agrotis agathina*, their condition being on the whole very good. This year my collecting rambles did not take me in that quarter. Until Mr. Carr's note appeared on the subject, I had no idea it was at all uncommon for a second brood to occur. — FRED. G. BELLAMY; Ringwood, October 17th, 1901.

In reference to Mr. F. M. B. Carr's note as to a late brood of *P. hippocastanaria*, I took five specimens of this insect in excellent condition at Midhurst, Sussex, on July 22nd, 1901, by working the common after dark with an acetylene lamp. — ALFRED E. TONGE; "Glen Royd," Devon Crescent Road, Red Hill, October 5th, 1901.

ORTHOSIA RUFINA FLYING BY DAY.—On Sept. 18th last, while searching for *Celana haworthii* near Sheffield, I took three *Orthosia rufina*—one at 4.5, one at 4.20, and one at 5.30—and also saw another, which I was unable to catch. They were flying wildly over the heather, apparently never settling. I certainly did not disturb them. The weather was sunny, but rather windy. Has this habit been noticed before?—E. A. COCKAYNE; 6, Tapton House Road, Sheffield, September 23rd, 1901.

NEMEOPHILA (CHELONIA) PLANTAGINIS IN AUTUMN.—I have had several imagines of this species emerge during the past autumn. Is not this unusual?—G. E. J. CRALLAN; Bodorgan Manor, Bournemouth.

[Although we are not aware of any recent records of the fact, we believe that an autumn emergence of this species is not altogether unusual.—ED.]

ÆSCHNA CYANEA, &c., IN YORKSHIRE.—I must take exception to my friend Mr. W. J. Lucas's statement (*ante*, p. 290) that *Æ. juncea* is more of a northern insect than is *Æ. cyanea*. In my own experience in Yorkshire quite the reverse is the case. *Æ. cyanea* occurs all over the county, and in the proportion, I should say, of a least twenty to one as compared with *Æ. juncea*. *Libellula depressa* occurs in Yorkshire—at Scarborough, York, and other places. This year *L. quadrimaculata* occurred in plenty at Halifax.—GEO. T. PORRITT; Crosland Hall, near Huddersfield, October 11th, 1901.

THE LEPIDOPTEROUS FAUNA OF HAMPSHIRE.—Mr. Moberly has already pointed out (*ante*, p. 18) that the list published in the 'Victorian History: Hampshire,' vol. i. (1900) is "not quite exhaustive." I should like to make a few further additions. *Eupithecia succenturiata* and *E. subfulvata* are not infrequent at Sandown, and probably elsewhere in the Isle of Wight and on the mainland; and I have this year taken larvæ of *E. plumbeolata*, also at Sandown. *Melanippe unangulata* is there common, and I have twice taken *Tapinostola hellmanni* in localities some few miles apart, one on each side of the town; I have not yet discovered its headquarters, but it does not seem possible that the specimens were immigrants or accidentally introduced. *Mamestra abjecta* occurs both at Sandown and Freshwater. The omission of *Noctua flammatrix* and of *Heliothis armigera* is perhaps intentional, for it is well known that they have both occurred in the Isle of Wight. *Dyschorista suspecta* has once been taken (by my friend Mr. H. H. May), and I am under the impression I have heard of its common occurrence in the New Forest. There was a record of *Micra ostrina* for the Culver Downs, Isle of Wight, in an early volume of the 'Entomologist,' but I cannot at the moment lay my hand upon it, and cannot vouch for its authenticity. *Hypenodes albistrigalis* is, I believe, common in the New Forest, where I took it not infrequently in 1894; I have also taken it in Parkhurst Forest, Isle of Wight. *Orobena stramentalis*, *Spilodes palealis*, *Scoparia lineolea*, and *Homœosoma binævella* are all Sandown species, and the omission of *Scoparia mercurella* from the list must surely be an oversight. I have done so little systematic work amongst the smaller things that I refrain from carrying my list of additions further. I should like to add that I am collecting materials for working out in some detail the lepidopterous fauna of the Isle of Wight, and

shall value any assistance which may be rendered.—LOUIS B. PROUT ; 246, Richmond Road, N.E., October 8th, 1901.

ERRATUM.—Page 296, lines 11 and 12, for “*externalis*” read “*extimalis*.”

CAPTURES AND FIELD REPORTS.

SPHINX CONVULVULI IN 1901.

Berkshire.—I had two *S. convolvuli* brought me last month, both taken within a short distance of my house, and heard of several others having been taken.—W. E. BUTLER; Hayling House, Reading, Oct. 12th, 1901.

Three specimens of *S. convolvuli* were sent to me by a friend, who is one of the deacons at Wellington College, Berks, on Sept. 27th last, and another was seen at the same place a few days later.—CHAS. F. THORNEWILL; Calderhall Vicarage, Whitechurch, Salop, Oct. 18th, 1901.

Bucks.—A living pupa of *S. convolvuli* was dug up in a potato allotment near Haddenham on Sept. 19th last, and given to me. I ascertained that the wild convovulus (*Convolvulus arvensis*) was growing freely thereon.—W. H. BARTON; The Poplars, Spencer Road, Chiswick, Oct. 16th, 1901.

Cornwall.—On September 21st I took on the wing in my garden three specimens of *S. convolvuli*—two males and one female. I saw one other specimen, but failed to capture it. One male was in perfect condition, the others slightly damaged. The next evening, in torrents of rain (it had rained incessantly throughout the day), I walked around the garden and saw two more specimens on the wing, but climatic conditions were totally against an attempt at capture. On Sept. 23rd I captured a female example on the wing in perfect condition; on Sept. 27th another female, and on Oct. 2nd a male specimen—both of the latter being slightly damaged. Three other captures have been reported to me: one taken at rest on some coloured drapery hanging on a clothes-line outdoors; one on the wing, in the daytime, in a pigeon-house, probably having been disturbed or dislodged; and one flying in a bedroom in the twilight.—W. A. ROLLASON; The White House, Truro, October, 1901.

Devonshire.—When I was staying at Dawlish this year a nearly full-grown larva of *S. convolvuli* was brought to me on August 28th. It had been taken in a garden in the neighbourhood.—HUGH MAIN; Forest Gate, London, E., Oct. 16th, 1901.

Two fine specimens of *S. convolvuli* were captured in the town during the first week in August, and are now in the possession of Mr. H. E. Monk. Mr. J. Chichester, on Sept. 7th, gave me a perfect specimen, evidently freshly emerged, taken at the bloom of the tobacco plant at Grenofen. Of six insects seen he succeeded in taking two. He states that two years ago they were still more common.—(Rev.) W. J. LEIGH PHILLIPS; Tavistock.

Dorsetshire.—*S. convolvuli* was plentiful here during the month of August, and I secured a good number of very fair specimens; as usual, they were mostly taken at tobacco plants. During September they

were not so numerous, but in better condition, and I think some must have been bred here. I am induced to think this not only from their condition, but from the following facts. On June 2nd, whilst hunting for *Acidalia degeneraria*, I disturbed and caught a male *S. convolvuli* in excellent condition. On August 2nd I had a larva of the insect brought me which had commenced to pupate, and which developed into a fine pupa. On Sept. 22nd a pupa was brought to me. Both larva and pupa had been dug up amongst potatoes. These pupæ are now quite lively, and I hope will develop into the perfect insect. The larva I had last year died in the pupa state.—JNO. T. HYDE; The Grove, Portland, October, 1901.

Essex.—Ten specimens of *S. convolvuli* were taken off the electric lamps here by Mr. Main and myself on Sept. 24th and 25th.—A. HARRISON; Forest Gate, London, E., Oct. 16th, 1901.

Hampshire.—As the larva of *S. convolvuli* seems to be so easily found, it may be of interest to add to the lately recorded captures another instance of its discovery. At the end of August (I have no note of the date) a full-fed larva was brought to me by a farmer who said that he found it amongst the stubble of an oat field. Bindweed was plentiful in the surrounding hedges. I did not allow the caterpillar to pupate, but preserved it for my collection. The moths of this species were very abundant here this year. On Sept. 9th I secured five at the flowers of *Nicotiana affinis*, and three on the following evening, but released four, as they were in bad condition. Several other specimens were sent to me by friends here, but were without exception too much damaged to be of any use. I also was told by many persons who have gardens that they had seen very large moths hovering over the flowers at dusk at the beginning of September.—ALBERT MAY; Hayling Island, Oct. 21st, 1901.

On Sept. 10th I found a fine freshly-emerged *S. convolvuli* at rest on an oak fence near Totland Bay. I have since found five more perfect specimens on fences here. Up to the time of writing over one hundred and eighty of these moths have been taken here. Besides, a friend of mine had five larvæ, and others had pupæ brought them which had been dug up in gardens, chiefly among potatoes.—G. E. J. CRALLAN; Bodorgan Manor, Bournemouth.

On October 1st a specimen of *S. convolvuli* was brought me, which had been caught at Botley station by Mr. C. Newman.—M. S. JENKYNs; Botley, Hants.

Hertfordshire.—A specimen of *S. convolvuli* was captured in a neighbouring garden and brought to me on Sept. 25th last. It is in rather poor condition.—PHILIP J. BARRAUD; Bushey Heath, Herts.

Kent.—*S. convolvuli* and *Acherontia atropos* appear to be fairly numerous again in the southern counties this year. I can record five of the former for the Farnborough district, and three of the latter for Bromley Common.—A. J. LAWRENCE; Bromley Common, Kent, Oct. 4th, 1901.

On Sept. 22nd I captured a specimen of *S. convolvuli* as it was flying over tobacco bloom at Wellesborough, near Ashford, the locality in which I took several examples of this species in 1898. A worn specimen, taken by a gardener at Riversdale, Lewisham, was brought to me on Sept. 24th, and on the 25th of the same month, at 9.30 p.m.,

I saw a specimen hovering over tobacco flowers in the garden here.—D. CHITTENDEN; 98, Court Hill Road, Lewisham.

Middlesex.—On October 2nd I took a fine specimen of *S. convolvuli* at rest on a wall in the High Street.—T. H. L. GROSVENOR; Boundary House, Hadley, Middlesex, Oct. 14th, 1901.

I have to record the capture of a fine pair of *S. convolvuli* at light near here on Sept. 1st. Five other captures of this species in Hampstead and Highgate have come to my knowledge during the past three or four weeks.—L. A. SPENCER; 52, Burghley Road, Highgate Road, N.W., Oct. 22nd, 1901.

A fellow student gave me a specimen of *S. convolvuli* on Sept. 25th. It was found at rest on a gate-post at Isleworth.—GEO. B. WALCH; Borough Road New College, Spring Grove, Isleworth.

Somersetshire.—Between August 18th and October 10th we have taken fifteen specimens of *S. convolvuli*, all in the garden flying over the tobacco plant.—J. P. LAWSON; Southview, Princes Road, Clevedon, Somerset.

Suffolk.—While staying at Bury St. Edmunds recently, I was shown a specimen of *S. convolvuli* which had been taken in a house in the town about the beginning of September.—A. R. KIDNER; St. John's College, Cambridge, Oct. 1st, 1901.

My father picked up a fine specimen of *S. convolvuli* on a road close to the sea on Sept. 23rd at Aldeburgh, Suffolk.—J. C. WALKER; 41, Hamilton Terrace, N.W.

Judging from different reports, *S. convolvuli* has been unusually plentiful this year. Several specimens have been taken at Stretton, and they have been frequent visitors to the flowers of petunias and the sweet-smelling tobacco plant (*Nicotiana affinis*) in my garden during the month of September. Two or three other specimens which had been taken in the town have also been left at the museum.—CLAUDE A. PYETT; 28, Waterloo Road, Ipswich.

Worcestershire.—Three specimens of *S. convolvuli* were captured at Malvern the latter end of September.—W. EDWARDS; Malvern.

COLIAS EDUSA IN CORNWALL.—On May 17th last, I took, near St. Austell, a very fine male specimen of *C. edusa*. He was very strong in flight, and gave me a smart chase. This was presumably a hibernated specimen, and is the only one I have seen in this district for the year. But what I wish especially to comment upon is with reference to my note (Entom. xxxiii. p. 309) wherein I recorded a large capture of *C. edusa*, together with eleven of the beautiful female variety *helice*. This year I visited the same locality and at the same time, but without seeing a single specimen of either. This is all the more remarkable as the lucerne field in which I took such numbers last year had not been ploughed up or disturbed in any way, there being a fair quantity of blossoms still in the field, which was being grazed by sheep. The weather was in all respects similar. Of *Pyrameis cardui* I also took a fair number last year in the same field—this time they also were absent. Is there any probable explanation of these remarkable facts? —W. A. ROLLASON; The White House, Truro, October, 1901.

COLIAS EDUSA AND *C. HYALE* IN HAMPSHIRE.—Although both of these species were so abundant here last year, only one specimen of

each was seen by me during the last season; *C. hyale* (var. *pallida*), Aug. 20th; *C. edusa*, Sept. 6th.—ALBERT MAY; Hayling Island, Oct. 21st.

COLIAS HYALE IN KENT.—*C. hyale* has again put in an appearance. This year I captured six specimens, on August 25th, at Hither Green—four males and two females, one of the latter a white variety.—D. CHITTENDEN; 98, Court Hill Road, Lewisham, S.E.

COLIAS HYALE IN WILTSHIRE.—While at Wylve this year I took four specimens of *Colias hyale*, one a very perfect dwarf form. I missed a good many others. I also took two specimens of *C. hyale* near Wimborne, Dorset. I captured a good many specimens of this species in 1900 at Wylve.—R. V. SOLLY; 40, Southernhay, Exeter, Sept. 25th, 1901.

VANESSA ANTIOPA IN HAMPSHIRE.—While collecting on one of the large heaths to the north of this town on September 13th, I observed a large dark brown butterfly struggling against the north wind, which was blowing strongly. It proved to be a worn specimen of *Vanessa antiopa*.—G. E. J. CRALLAN; Bodorgan Manor, Bournemouth.

VANESSA ANTIOPA IN DEVONSHIRE.—A fine specimen of *V. antiopa* was seen in a garden here on September 20th by Mr. H. Kerslake. It was feeding on a decayed apple, but unfortunately it escaped capture. A Newton College boy was more fortunate on Dartmoor last month.—(Rev.) W. J. LEIGH PHILLIPS; Tavistock.

VANESSA ANTIOPA AT EPSOM.—A specimen was caught by Mr. Gurth Edelsten in the garden of Mead House, Epsom, Sept. 9th, 1901.

VANESSA ANTIOPA IN THE NORTH OF LONDON.—I came across a fine specimen of *V. antiopa* (Camberwell Beauty) on August 25th in the North of London. Should you care to have further particulars, I shall be happy to give you any information and corroboration you may require, as I was with three other men at the time.—A. PODMORE; 2, Palace Road, Streatham Hill, August 27th, 1901.

[We wrote to our correspondent asking for more precise information as to locality, but so far we have not been favoured with a reply.—ED.]

VANESSA POLYCHLOROS, &C., IN LONDON.—On July 19th I captured a freshly emerged specimen with my hat as it was sitting on parapet of the railway at Abbey Street, Bermondsey, S.E. I believe that it was bred near there, as my son took one last year on July 21st close to South Bermondsey Station. I also noticed several *Lycana argiolus* flying in the Court Hill Road, Lewisham, and in my garden, as last year, at the end of April, and one or two of the second brood were also seen.—D. CHITTENDEN; 98, Court Hill Road, Lewisham.

HYBERNATION OF VANESSIDÆ.—A specimen of *Vanessa urticae* took up its winter quarters, on July 22nd, on the ceiling of the bath room, which contains a hot-water cylinder, and faces west, and is always warm. At the same time there were many colonies of young larvæ from this same brood which in due time would produce butterflies which would naturally hibernate; but why should some individuals hibernate so early in the year?—(Rev.) C. A. SLADEN; Burton Vicarage, Chester.

EUGONIA AUTUMNARIA AT DOVERCOURT.—The morning of the 4th instant was dull and mild, with a south-westerly breeze, and a steady drizzle until 2 p.m., when it cleared off, and the wind went round to the north-east. Just before dusk I sugared some trees and twigs in hedges by the side of the road near my house, and at nine o'clock went out to see the result. It was then fine, bright, and cold, and the north-easterly breeze had freshened considerably, and I was not surprised that only two visitors came to my sugar—*Anchocelis pistacina* and *Catocala nupta*; but while I was examining one of the trees I caught sight of a moth clinging to the under side of some autumn-tinted elm trees. It was a "thorn," much the colour of its surroundings, and was very quiet and allowed me to box it. I thought it was *Eugonia quercinaria* or *E. alniaria*, but next morning when I looked into the box I found it was a female *E. autumnaria*. This is the first time I have met with this (formerly rare) species, and I wonder if it is a native, an immigrant, or an escape? It is smaller than any of the females I possess—and I have a good series—so I fancy it may be the offspring of inter-bred parents. I kept her for several days, and she deposited about a hundred eggs, which appear to be fertile, as they have changed colour.—GERVASE F. MATHEW; Dovercourt, Oct. 17th, 1901.

ENISTIS QUADRA IN IRELAND.—With reference to the occurrence of *Enistis quadra* in Ireland, the following record may be of some use. On July 26th I took a damaged female specimen in a house at Nenagh, Co. Tipperary.—F. W. J. JACKSON; 2, Vicarage Gate, Kensington, W., Oct. 1st, 1901.

HADENA GENISTÆ AT CHICHESTER.—Several specimens of *Hadena genistæ* were taken at sugar during June last by Mrs. Fogden, of Ryman's Tower, Apuldrum. I have not had time to refer to our local list of Lepidoptera, but I believe that this is an addition to it.—JOSEPH ANDERSON.

PLUSIA MONETA AT CAMBRIDGE.—On July 6th I took a specimen of *Plusia moneta*, settled on a gas-lamp, in St. John's College, Cambridge, almost in the same spot as the one recorded last year.—A. R. KIDNER; St. John's College, Cambridge, Oct. 1st, 1901.

CARADRINA AMBIGUA AT RINGWOOD.—Last year I took this species in scores upon flowers of *Clematis* here in my garden, and left plenty; this season I have only seen seven in all. Is *ambigua* going to die out, or, at least, has it found its level, and in future will be scarce again? Fresh importations of plant and insect life, although often prolific for a time, do sometimes die out, or barely exist in a new locality. It would be interesting to hear if this species has been scarce in other localities also.—J. HY. FOWLER; Ringwood.

ACHERONTIA ATROPOS LARVÆ: A VARIETY.—On Aug. 20th a gardener here sent me two larvæ of *A. atropos*; one was a full-grown specimen of typical appearance, the other differed from it immensely, answering the description of the variety given by Morris in the 5th (1896) edition of his 'History of British Moths'—"Sometimes the caterpillar is olive-brown, whitish in front, and the stripes darker." In my larva the stripes were very dark brown, and the whitish patches in front well

marked and distinct. I killed and preserved it, and the gardener told me that when he found those two larvæ in a potato patch he trod on a second larva like the dark variety, and killed it. Subsequently from a distant part of the island another larva with the same peculiarities was brought to me. I tried to rear it, but it died.—ALBERT MAY; Hayling Island, Oct. 21st, 1901.

ACHERONTIA ATROPOS IN CORNWALL.—I have a very fine specimen of *A. atropos*, $5\frac{1}{4}$ in. across wing-tips, found on October 16th. It was taken in a street in the city, where there is considerable traffic, at rest on the curbstone, and where it was attracting considerable attention. When touched it several times uttered the shrill squeaking sound peculiar to this insect, and repeated same when placed in a box at home.—W. A. ROLLASON; The White House, Truro, Oct. 19th, 1901.

ACHERONTIA ATROPOS IN SUSSEX.—I have just set a fine female specimen, which was taken at rest on a fence at Worthing. I also received a larva from the same town.—A. J. LAWRENCE; Bromley Common, Kent, Oct. 4th, 1901.

ACHERONTIA ATROPOS IN YORKSHIRE.—On August 17th I captured a full-grown larva of *A. atropos* in a garden near the middle of Hull. Practically the only plants were nasturtiums and stocks. Can it have fed on either of these? It could not have come from a neighbouring garden, as we are cut off by high walls from the nearest of them. It pupated on the 27th, but the imago has not yet emerged.—GEO. B. WALSH; Borough Road New College, Spring Grove, Isleworth, Sept. 25th, 1901.

CHÆROCAMPA CELERIO IN WILTSHIRE.—I had this morning sent me by post a specimen of *Chærocampa celerio* from Wylze, Wiltshire. It was sent me in a cardboard box, was quite relaxed, and consequently had not been long dead, but was unfortunately a good deal rubbed. I may mention that I spent three weeks at Wylze in August, and that it was my landlord who sent me this insect.—R. V. SOLLY; 40, Southernhay, Exeter, Sept. 25th, 1901.

BUTTERFLIES IN THANET.—Acting upon the "tip" of a school-boy (see *ante*, p. 23), I went in search of *Aporia crataegi* early in July, and captured six specimens, one male and five females. They were easily detected from ordinary whites, and not difficult to catch, and, as they were scattered as far as two miles apart from first to last, it is satisfactory to find there is a possibility of this species getting commoner here. On Sunday, August 18th, I had the pleasure of seeing a specimen of *Pieris daphidice* on the wing, close to Dane Park. Having no net with me, I was obliged to use my hands, and I was lucky enough to catch it, as it settled quietly on a lucerne flower. It is a male in good condition. On the wing it resembled a female *Euchloë cardamines*, but its flight was weaker, and in no way could it be mistaken for an ordinary white. During the spring and early summer I have searched without success for the "clouded yellows" in every stage. On August 9th the first specimen of *Colias hyale* appeared, a lovely male in perfect condition; on the 10th, another fresh male; 12th, two ditto; 14th, seven specimens, including one female; 16th, twelve specimens

(three females). Since then it has been common on sunny days, but has rapidly deteriorated in condition; yesterday I took eight specimens, but only two were fit to keep, both fresh males. Having over a mile of lucerne close at hand, I can readily watch this species, and have walked round on most fine sunny days. So far, *Colias edusa* is very scarce, the first specimen, a fresh male, was captured on Aug. 16th, and no other put in an appearance until yesterday (Sept. 10th). This I missed, but it is not yet too late. The Vanessids have been remarkably scarce; of *Pyrameis cardui* I have not seen more than six; *Vanessa polychloros*, bred two; *V. urticæ*, a few only; *V. io*, none (this is always scarce in Thanet); *P. atalanta*, one fresh specimen seen yesterday (hybernated specimens of *P. atalanta*, *V. urticæ*, and *V. cardui* were of course seen earlier); apparently hot summers do not suit the Vanessids here. *Lycana argiolus*, first seen on May 1st, and has been here more or less—in condition, good, bad and indifferent—ever since. *L. agestis*, commoner than usual, and has been taken in the park. *Thecla betulæ*, I beat eight larvæ from one sloe bush, but could not find it anywhere else. *Melanargia galatea*, same as *L. agestis*. Fritillaries are unknown, for *Argynnis latonia* has not yet turned up. — J. P. BARRETT; 3, St. John's Villas, Margate, September, 1901.

NOTES FROM DEVON AND NORTH SOMERSET.—As we do not get very many notes from North Somerset, perhaps the following may prove of some interest. I have been staying at Porlock, almost on the borders of Devonshire (August 9th to 19th). Of course, the time of year is not a very good one, or I should undoubtedly have worked harder and done much better. The place is surrounded by moorland hills, on which heath, ling, and bilberry grow in profusion. A good idea of the country can be got from 'Lorna Doone,' which deals with these parts. August 13th and 14th were spent at the now famous Dawlish (South Devon), and very bad weather was unfortunately experienced there. The attraction was, of course, *Callimorpha hera*, but the weather was so boisterous that I only succeeded in catching one specimen, and that was at dusk. August 14th was spent searching for *Bryophila glandifera* (*muralis*) in a terrific storm of wind and rain. One example and a thorough soaking were the result. The following species were also noticed at Dawlish:—*Pieris brassicæ*, *P. rapæ*, *Epinephele tithonus*, *E. ianira*, *Miana furuncula*, *Bryophila perla*, *Rumia cratægata*, *Crocallis elinguaris*, *Melanippe fluctuata*, *M. galiata*, *M. subtristata*, *Melanthia ocellata*, *Camptogramma bilineata*, *Coremia* (? *unidentaria*), *Acidalia marginipunctata*, *A. aversata*, *Abraxas grossulariata*, *Eubolia bipunctata*, *E. mensuraria*, *Botys asinalis* (very local), *B. ruralis*, *Pyralis farinalis*, *Herminia devalis*, and *Pionca forficalis*. Rather a miserable lot for such a celebrated place, but, no doubt, owing to weather and want of knowledge of the locality. August 16th was spent at Lynton and Lynmouth (North Devon), but this was more for the purpose of seeing the beautiful scenery than of collecting. *Epinephele tithonus* and *E. ianira* were, of course, seen; also a single specimen of *Macroglossa stellatarum*, in the gardens of the Tors hotel. A few *Melanippe galiata* were disturbed, and I also found a spot for *Larentia olivata*, which were in grand condition, but at the time I was, unfortunately, netless. *Botys asinalis* occurred in the same spot. The rest of my collecting

was done chiefly between Porlock and the Doone Valley, and was confined almost entirely to day-work. Of the butterflies, one example of *Colias hyale* was seen on the moors. *Pieris brassicæ*, *P. rapæ*, and *P. napi* were all fairly common. A few *Argynnis* (*Dryas*) *paphia* were noticed, in a somewhat worn condition. *Satyrus semele* was abundant on the moors, and *Pararge megæra* seemed to occur in great numbers almost everywhere, but only two specimens of *P. egeria* were observed. *Epinephele tithonus* and *E. ianira* abundant. *Vanessa urtica* was also very common, and a single example of *V. io* was seen at Dunster (Somerset). *Lycana icarus*, *Cyaniris argiolus*, *Polyommatus phlæas*, *Thecla quercus* (one), *Cænonympha pamphilus*, and *Pamphila linea* (*thaumas*), complete the list of butterflies. Turning to the moths, a single *Macroglossa stellatarum* was seen on the moor. A few *Apamea oculea* and *Triphana ianthina* turned up, and single examples of *T. jimbria*, *T. comes*, *Abrostola triplusia* (to light), and *Plusia gamma*. Geometers were rather better represented, the following species being observed:—*Ephyra porata* (one), *Camptogramma bilineata*, *Hypsipetes clutata* (worn), *Larentia didymata* (found at rest in the day-time on rough stone walls and banks, and flying abundantly over the whortleberry at sunset), *Rumia crataegata*, *Cidaria truncata* (a very nice lot, containing some very pretty forms, beaten from a place about two hundred and fifty yards long, where the whortleberry grew very thickly under a beech hedge), *C. populata* (obtained from the same lot of *Vaccinium* as *C. truncata*), *C. testata* (a few turned up in a sheltered corner of the moor), *Boarmia rhomboidaria* (a large and worn female), *Melanippe galiata* (not common), *M. subtristata*, *Melanthia ocellata*, *Acidalia aversata*, *A. marginepunctata* (a few very nice grey forms found at rest on rough grey stone walls, and differing considerably from some just taken in Kent). *Hyppena proboscidalis* (worn) and *Botys ruralis* complete the list of imagines. Larvæ taken were:—*Euchelia jacobææ* (common), *Dasychira pudibunda* (one), *Spilosoma menthastri*, *Demas coryli* (common), *Lophopteryx camelina* (a few), *Amphidasys betularia*, and *Eupithecia nanata* (one). With regard to *Demas coryli*, I did not discover their presence till just before leaving. From the low beech hedges on the moor I then beat over fifty larvæ in an hour and a half. They varied considerably in size and colour—dark greyish, white, yellowish, and pink. One larva of *L. camelina* was red; although I have frequently taken the larva, I have never seen one of this colour before. Dragonflies were practically nil, *Sympetrum striolatum* alone being seen.—F. M. B. CARR; 46, Handen Road, Lee, S.E.

SPHINGIDÆ AT RINGWOOD.—Larvæ of *Acherontia atropos* were abundant last year, but this season they appear to have been more so, nearly every potato patch producing them. I obtained my first, a full-fed one, on Aug. 8th, and the last on Oct. 5th. The latter was wandering about in search of food; it was very small indeed, but has pupated. I have had pupæ brought to me right up to Oct. 11th, when a digger brought three which he turned up on that date. On Sept. 15th a pupa was brought to me; this was dark in colour, and a fine male imago emerged from it on the 17th; the pupa, upon being touched, squeaked several times, but not so loud as the imago did after emergence. I have specimens hatching out almost daily now in my

breeding-pan; I keep the pupæ very moist and warm upon a layer of earth. On Sept. 17th I had the pleasure of taking a fine female *A. atropos* which was settled upon a potato-stem; a neighbour discovered and kindly directed me to it. Doubtless if the fields where it occurs were carefully searched, a number might be found about this date. *Sphinx convolvuli* has also turned up commonly. I had larvæ, pupæ and imago, all at the same time alive; the imago was plentiful from Aug. 16th to the end of the month; they were nearly all females, and worn. I tried to obtain ova, but without result, and upon opening them I discovered they had already deposited; still there appeared to be a mass of soft ova in one or two examples. Up to Sept. 13th many were seen, in fact scarcely a night passed with a blank. Afterwards they were less plentiful, but suddenly, during the first week of October, I netted four perfectly good males, which were undoubtedly British born, and since Oct. 7th I have not seen any more, as the nights have been frosty. From Sept. 6th to 20th I had two larvæ and two pupæ brought to me, and one pupa dug by myself. Two imagines emerged on Oct. 3rd, another on the 14th; one pupa died, which I am keeping, and a larva died in changing. No doubt I could have obtained more larvæ had I discovered earlier that they were to be found. From the above notes I should say the life-histories of both species are identical. I had each alive in three distinct stages. Specimens of each were also reared without forcing. It will be interesting if *S. convolvuli* survives our winter, and is to be found about July next year; if so, larvæ should be found commonly during August and September. *S. ligustri* and *Smerinthus ocellatus* have been especially plentiful in the larval stage.—J. HY. FOWLER; Ringwood, Hants, Oct. 16th, 1901.

NOTES FROM ILFORD, &c.—*Acherontia atropos*, larva found leaving potato plot, Aug. 28th, 1901; pupated by Sept. 5th. *Sphinx convolvuli*, perfect imago found on a fence at mid-day, Sept. 21st, 1901. *Smerinthus ocellatus*, *S. populi*, and *S. tilia*, larvæ recently taken and now pupated. *Chærocampa elpenor*, larva found in 1900. *Macroglossa stellatarum*, very numerous in 1900. *Lycæna argiolus*, several taken, 1901; also two seen on the wing, July 12th, in Ebury Street, Pimlico; several also seen, July 19th, at Belvedere, Kent.—JOSEPH ADAMS; 38, Empress Avenue, Cranbrook Park, Ilford, Essex, Sept. 21st. 1901.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—October 2nd, 1901.—The Rev. Canon W. W. Fowler, President, in the chair. Mr. G. C. Champion exhibited a long series of *Buprestis sanguinea*, Fabr., from Albarracin, Spain, showing the remarkable dimorphism of this species. — Mr. H. St. J. Donisthorpe exhibited, on behalf of the Rev. H. S. Gorham, of Shirley Warren, a specimen of the scarce beetle, *Hister marginatus*. Mr. Champion remarked that the species had been taken by Mr. Harwood, of Colchester. He also exhibited a number of rare Coleoptera from the New Forest—(a) *Velleius dilatatus*, F., twelve specimens, ten from one hornets' nest in August, and the other two from two other

nests, caught in specially constructed traps, the largest male reaching the abnormal size of 32 mm.; (b) *Anthaxia nitidula*, L., twelve specimens taken in July, one being of bluish colour; (c) *Agrilus sinuatus*, Ol., one of several which escaped—a beetle not taken for many years; (d) *Agrilus viridis*, L., a series from willows in August; (e) *Platydemus violaceum*, F., five specimens—a species also not recorded recently; (f) *Collydium elongatum*, F., one specimen taken in the burrows of *Melasis buprestoides*, and another in the burrows of *Scolytus intricatus*. Mr. Champion said that *Platydemus* had been taken twenty years ago by Harris, while Mr. George Lewis associated *Velleius* with *Cossus*, and not with hornets.—Mr. C. P. Pickett exhibited a long series of *Lycæna corydon* taken during August, 1901, at Dover, varieties and aberrations, including two females with upper wings wholly blue, dwarfs no larger than *L. minima*, and others (males) with under sides devoid of spots. He also exhibited a series of *Angerona prunaria* (bred June and July, 1901), the results of four years' interbreeding, the colouration ranging, in the females, from bright yellow with no bands to very dark with deep chocolate bands, and in the males from plain intense orange with no bands to deep chocolate with bands, while one male assumed the coloration of the female.—Prof. T. Hudson Beare exhibited a specimen of *Medon castaneus*, Grav., taken in a water net on April 22nd, 1901, at the edge of a pond in Richmond Park, having evidently come off the long grass growing at the edge of the water. Very few observations of this beetle have been recorded, and they all seem, as in this case, to have been chance captures, its habits being unknown.—Mr. A. Harrison exhibited a series of *Amphidasys betularia* bred from parents taken in the New Forest in 1900, including twenty males and thirty-nine females, and six gynandromorphous specimens, out of seven bred, one being a cripple. The larvæ when first hatched were kept indoors, but were afterwards sleeved on birch when a few days old. Mr. Tutt said it was very remarkable that so many gynandromorphous specimens should have been secured from a single brood. There appeared to be frequently modification in the sexual organs corresponding with external variation of the secondary sexual characters. Mr. Merrifield remarked that the proportion of gynandromorphous forms in hybrid specimens was always much larger. — Mr. C. J. Gahan exhibited a male specimen of *Thamnotrizon cinereus*, L., one of the long-horned grasshoppers taken by Mr. F. W. Terry at Morden, near Wimbledon. He called attention to a very interesting abnormality displayed by the specimen in possessing two pairs of auditory organs instead of a single pair, the second pair being situated on the tibiæ of the middle legs in a position corresponding with that of the normal pair on the fore legs. —Mr. F. Merrifield exhibited a series of *O. antiqua* bred from pupæ placed in a refrigerator five weeks and then exposed to a mean temperature of 48° Fahr. Specimens thus treated were much darker than types of those occurring in a natural state, some approaching in depth of colouring to *O. gonostigma*. He also exhibited for comparison specimens from Sutherlandshire, lent by Mr. C. G. Barrett, none of them, however, comparable in darkness to those obtained by his experiment; and others from the collections of Mr. A. Bacot (including four of the American species) and Mr. L. B. Prout. Mr. Tutt said that the limits of variation in our own form were little known, and the most northern

examples, though the largest, were decidedly not the darkest. — Mr. R. South communicated a paper by the late Mr. J. H. Leech, B.A., entitled “Lepidoptera-Heterocera from China, Japan, and Corea (Pyrilidæ).” — Mr. G. C. Champion contributed “Notes and Observations upon the Sexual Dimorphism of *Buprestis sanguinea*.” — H. ROWLAND BROWN, *Hon. Sec.*

SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—*July 25th, 1901.* — Mr. A. Harrison, F.L.S., in the chair. — Mr. Kemp exhibited species of Coleoptera taken in the New Forest at the end of June, including *Donacia crassipes*, *D. versicolore*, *D. sericea*, *Strangalia nigra*, *Asemum striatum*, *Anoplodera sexguttata*, *Leipus nebulosus*, and *Coccinella sedecim-guttata*. — Mr. Adkin, a bred series of *Lobophora polyommata* from larvæ taken near Brighton. — Mr. Step, living larvæ of a species of *Cassida* found feeding on hemp-nettle (*Galeopsis tetrahit*) on Wisley Common, Surrey. — Mr. Turner, larvæ of *Macroglossa stellatarum* from Bromley, Kent; they were of three forms, (1) delicate pink, (2) green with white lines, (3) very dark olive, almost black. — Mr. Edwards, several species of *Papilio*, including *Papilio agestilus*, *P. archisilus*, *P. paris*, *P. cressphontes*, *P. paon*, *P. marcellus* and var. *walshii*, and *P. asiaticus*. — Messrs. Harrison and Main, a fine bred series of *Geometra papilionaria*, and a series of well-marked *Tephrosia biundularia* var. *delamerensis*, both from Delamere Forest. — Mr. Edwards, a box of insects just received from Bucharest, including examples of *Libellula quadrimaculata*, *Platetrum depressum*, and *Centrotus cornutus*. — Mr. Enock, bred series of the dragonflies *Anax imperator*, *Cordulia ænea*, and *Brachytron pratense*, the two former from Esher and the latter from Wisley.

August 8th. — H. S. Fremlin, Esq., President, in the chair. — Mr. R. Adkin exhibited a bred series of *Geometra papilionaria* from Bexley, Kent, and noted the sensitiveness of its colour, explaining his method of preservation, stupefying with cyanide and killing with oxalic acid. Mr. Main said that he and Mr. Harrison had used chloroform as the stupefying agent with even greater success. — Mr. Manger, a large light coloured *Sphinx ligustri* from Brockley, and a male of the dragonfly *Æschna cyanea*, taken in his garden at New Cross. — Mr. Hy. J. Turner, a pupa of *Macroglossa stellatarum* from Bromley, showing the curious beak, and a short bred series of *Agrotis ripæ*, from Dawlish, and referred to the marked difference in shape between the males and females. — Mr. Step, *Cassida equestis* bred from the larvæ exhibited at a previous meeting, stating that they pupated about July 25th, and emerged about July 31st. — Mr. Fremlin, a number of gall excrescences on the twigs of hornbeam, which had been produced by a species of *Aphis*. — Mr. Edwards, a number of rose-leaves disfigured by a carpenter bee. A discussion took place as to the selection of leaves of particular shrubs, and the shapes of the pieces cut out. Mr. Turner stated that they regularly burrowed in the soil in the cactus-pots in his greenhouse. — Rev. H. Wood, two spiders, *Theridion lineatum*, females with egg-cocoons. The living specimen had killed the preserved one and appropriated its egg-case, fixing them both together on the lid of the tin. — Mr. Step read the Report of the Field Meeting held at Mickleham on June 22nd, which was attended by forty members.

August 22nd.—Mr. F. Noad Clark, Vice-President, in the chair.—Dr. Chapman exhibited a larva of *Grællsia isabellæ* from Spain, the only European species of the Attacinae group of the Saturniidae, and pointed out the protective nature of its colour resemblance to the twigs of its food, Scotch fir.—Mr. F. H. Day, local and rare Coleoptera from Carlisle, including *Donacia discolor* of all shades and variation; *Hydrothassa hanoverana*, eighteen specimens by sweeping *Caltha palustris*; *Bradycellus collaris*; *Spharites glabratus*, one of two specimens taken in carrion and very rare; *Telephorus abdominalis*, found among bracken; *T. darwinianus*; *Rhynchites cupreus* from mountain ash; and *Agabus arcticus*, one of the rarest British Agabi.—Mr. Enock, a pair of *Orthetrum cancellatum*, captured in cop., at Wisley on July 20th; the female was of the same blue colour as the male.

September 12th.—Mr. W. Lucas, B.A., Vice-President, in the chair.—Mr. South exhibited two specimens of the "buff variety" of *Amphidasys betularia*, type form; and a buff variety of var. *doubledayaria*. The latter specimen was bred, with several similar examples, by Mr. John Taylor, of Oldham, some years ago. He remarked that Mr. Taylor had informed him, in reply to a direct question on the point, that "the larvæ, pupæ, and imagines of buff *betularia* were never in any place where they would be subject to the influence of chlorine vapour, or anything that might tend to change their colour."—Dr. Chapman, a much suffused black var. of an *Argynnis* sp. from Spain; in shape it was *A. aglaia*, but the under side was marked like *A. adippe*.—Mr. Lucas, for Mr. H. E. Annett, a var. of *Epinephele hyperanthus*, from Oxshott, nearly approaching var. *arete*; a male specimen of the large earwig, *Labidura riparia*, taken by Major Robertson in Pokesdown, Aug. 1900; and coloured drawings of (1) *Argynnis paphia*, male, a pale yellow var.; (2) *Epinephele tithonus*, female, a xanthic var.; both from specimens taken in the New Forest.—Mr. Kirkaldy, numerous species of Miridæ = Capsidæ, of the genera (1) *Orectodorus*, most of which are ant-mimics, and (2) *Resthenia*.—Mr. West, of Greenwich, long series of three closely allied and obscure species of Homoptera—*Acocephalus brunneo-bifasciatus* and *A. flavo-striatus*, both from roots of grass on waste land at Catford, and *A. albifrons*, under furze bushes, Blackheath.—Mr. Kemp, living nymphs of the Odonata, *Sympetrum striolatum*, *Gomphus vulgatissimus*, and *Calopteryx virgo*, all from the New Forest.—Mr. Edwards, some remarkable pendant galls on the under side of a leaf of a shrub, *Machilus duthiei*, from North-west India.—HY. J. TURNER, Hon. Rep. Sec.

BIRMINGHAM ENTOMOLOGICAL SOCIETY.—July 15th, 1901.—Mr. H. Willoughby Ellis, Vice-President, in the chair.—Mr. J. T. Fountain showed a series of *Tæniocampa instabilis*, to illustrate its wide range of variation.—Mr. A. H. Martineau, *Bombylius*, sp. = *canescens*? from West Malvern.—Mr. H. Willoughby Ellis, in illustration of his paper, the following Coleoptera; *Metæcus paradoxus*, *Aleochara fuscipes*, *Homalota trinotata*, *Xantholinus linearis*, *Cryptophagus pubescens*, and *Anthicus floralis*.—Mr. Ellis read, for Mr. H. St. John K. Donisthorpe, a paper entitled "All that is known of *Metæcus paradoxus*," in which an account was given of its extraordinary life-history, &c.—COLBRAN J. WAINWRIGHT, Hon. Sec.

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LIFE-HISTORY OF *HESPERIA COMMA*.

BY F. W. FROHAWK, F.E.S., M.B.O.U.

As I believe that this species has hitherto never been successfully reared from the egg, the following life-history may be of some interest to those who may have a desire to rear this interesting butterfly. On August 17th, 1900, I found a few *Hesperia comma* on the wing over a small patch of chalky ground covered with a short dense growth of various grasses (but the fine hair-grass predominating), rock-rose, thyme, &c., and soon detected one (a female) hovering close over the plants, so by carefully watching it I saw her settle on a tuft of hair-grass (*Aira cæspitosa*), and after walking over and among it a little time, she curved her abdomen down and deposited a single egg on one of the fine hair-like blades, or rather spines, and close by, within an inch, I found another egg, similarly laid, which, from its darker colouring, I should suppose had been deposited about three or four days previously. After securing these two eggs, I dug up the plant of grass as well as other similar plants for potting, and then captured a few females, which I subsequently placed on the plants, and on August 20th they deposited a large number of eggs upon the grass-stems and blades.

The egg is very large in proportion to the butterfly, measuring $\frac{1}{26}$ in. in diameter at the base; in shape it exactly resembles an inverted pudding-basin, having a sunken crown, rounded sides, and a well-developed basal rim; the base is quite flat; the surface is finely granulated, forming reticulations near the base which run into ridges to the rim; when first laid the colour is pearl-white with the slightest yellowish-green tinge, which very gradually turns deeper in colour, assuming a pale straw-yellow on the sixth day, and when a fortnight old it is a clear pale apricot yellow, which colour it remains until the middle of January, when a slight change begins to take place by the

colouring gradually fading until it finally turns to an opaque white with the faintest yellowish hue at the base and rather leaden in certain lights on the crown. It remains unchanged during February and March; at the end of the latter month, or the first few days of April, it hatches. After hatching, the shell is a dull opaque white.

On April 1st, 1901, the eggs began hatching; nearly all were hatched by the end of the first week in that month. The larva eats a circular hole in the crown of the egg, through which it emerges. Directly after emerging it measures $\frac{1}{12}$ in. long; the head is proportionately large, the body swollen at the middle, attenuated at both ends but mostly so on the first segment, which is furnished with a dark-brown shining collar; it is wrinkled transversely and lobed laterally; the entire body is a rich deep straw-yellow, which becomes paler after feeding; on each side are four longitudinal rows of very minute knobbed points, all of about equal size; the first and second rows are dorsal and subdorsal, the third and fourth are super-spiracular and sub-spiracular; excepting those forming the latter row, all the points are directed forwards, those on the anal segment are longer and only slightly clubbed; along the lateral region, including the claspers, are a number of minute spines pointing downwards; all the points and spines are white and glassy with dark bases; the entire surface is granular; the head shining black, granulated, and bears a number of tiny whitish spines; the mouth-parts are brown; the legs and claspers the same colour as the body. If the young larva is in any way disturbed, however slightly, it immediately contracts and rolls itself up with the head touching the eighth segment, and remains motionless for several minutes. It does not eat the empty egg-shell, but directly after leaving the egg it starts spinning the fine grass together into a somewhat dense cluster an inch or two above the ground. In this compact shelter the larva lives and feeds upon the grass surrounding it, remaining almost always completely hidden. Sometimes as many as three or four live together. It appears to be chiefly nocturnal, as I have always found them quietly resting during the day, and exceedingly difficult to see, as they are so well hidden. The first stage lasts for about one month.

On May 2nd I found many of the larvæ had recently moulted for the first time. Just before first moult it measures $\frac{1}{6}$ in. long, the colour being the same as when first hatched. Soon after first moult the colour along the dorsal surface has a decidedly greenish tinge; the rest of the body is pale straw-yellow. It is more thickly sprinkled with minute white glassy angulated knobbed points with black bases; and on the dorsal surface of each segment are two shining black spiracular-like rings, and another just above the true spiracle; also on the second and

third segments are two larger ones precisely like spiracles; all these, as well as the spiracles, are black. The head is similar to previous stage. The first segment, which is freely retractile, has the anterior half of a lilac-flesh colour, which is the elastic portion, the posterior half having a shining black band encircling the upper half. On May 21st all the larvæ still in the second stage.

Upon examining the larvæ on May 28th I found several had just moulted the second time, and others undergoing the moult, and some of similar size but not yet moulting. The second stage lasts between three and four weeks. Shortly before second moult it measures $\frac{2}{3}$ in. long. The anterior segments, especially the first, are much smaller than the rest of the body, being considerably swollen about the middle; the anal segment has the dorsal surface speckled with brown. As in the first stage, they live entirely concealed in the tubes of grass spun closely together. They crawl rapidly either forwards or backwards, similar to other case-dwellers, and feed on any species of grass that happens to be interwoven with the hair-grass.

On June 14th I again examined them, and found over two dozen larvæ in different stages; some after the second moult, and others after the third moult, but varying greatly in size.

After second moult, and shortly before third moult, about seventy days old, it measures while resting about $\frac{3}{8}$ in. long. The general colouring is pale greyish-green, but some are of a decidedly ochreous hue; in all other respects they are precisely similar to previous stage.

After third moult, and seventy-five days old, the whole of the colouring of the body is a dull olive-green, slightly paler on the ventral surface including the claspers; the legs are black and shining; the head now exhibits two ochreous vertical parallel lines down the crown, and an ochreous Λ marking above the mouth; otherwise the form and structure of the larva is similar to the earlier stages.

After fourth moult and full-grown, about one hundred days old, it measures $1\frac{1}{8}$ in. in extreme length while crawling. The head is large and similar to previous stage in colour. The first segment is very small, elastical, and retaining the black collar of former stages; the following segments gradually increase in size to the sixth, and taper from the ninth to twelfth. The entire surface is densely sprinkled with minute shining black warts, each emitting a tiny amber-coloured spine with a clefted knobbed apex; those on the ventral surface are simple spines, and rather longer. The skin is also covered with fine regular granulations, which are dusky in colour, and exceedingly minute. Besides these, there are sprinkled over the whole surface very small spiracular-like processes, the largest being situated on the claspers (which have a shining whitish film-like surface stretched

over the centre), and one on each segment below the true spiracle, which (the latter) is conspicuous, black and shining. The tenth and eleventh segments have the anterior half of the ventral surface covered with a white rough granular waxy substance.

If disturbed while crawling, the larva frequently wriggles backwards very rapidly, similar to the habit of wriggling possessed by many micro larvæ.

Just before pupation the larva often crawls restlessly about, but in some instances it does not leave its place of feeding, and spins a strong coarse network cocoon among the grass close to the ground, weaving the gnawed loose pieces of grass with the fine stems and blades, and therein pupates during the latter part of July.

The pupa measures $\frac{3}{4}$ in. long. The head is rounded; the thorax slightly swollen; the abdomen cylindrical and tapering, terminating in a long anal point furnished at the extremity with an ample bunch of cremastral hooks, which are very securely anchored to a pad of silk spun for the purpose at the end of the cocoon. The head, thorax, and abdomen are clothed in short stiff spines; below the spiracles they occur in dense tufts. Those on the head are remarkably formed, all the longer ones terminate in a hook; these are in patches, the largest patch covering the eye. These hooks are also fastened into the cocoon, so that the pupa is securely anchored "fore and aft." At the base of the wing is a peculiar raised disc. The whole surface of the wings, antennæ, and legs are covered with a lilac-grey bloom, which is very easily detached; it also covers the cocoon like whitish powder, and small flakes are scattered over the pupa, apparently of the same substance as that on the larva. The head and thorax are pale olive, mottled with blackish; the abdomen olive, spotted with dark olive, and inclining to yellow on the ventral surface; below each spiracle is a short longitudinal mark; the spiracles are amber-brown. This description is of the female pupa. The male differs by having a well-defined elongated dusky ridge covering the androconial mark on the primary wing.

The first one, a fine female, emerged on August 3rd, 1901. All its stages much more resemble those of a moth than a butterfly.

It is curious to note that, besides other plants, *Coronilla varia* is given as the food-plant of *H. comma* by several authors, including Barrett, 'Lepidoptera of the British Islands'; Kirby, 'European Butterflies'; Meyrick, 'Handbook of British Lepidoptera'; Westwood and Humphreys, 'British Butterflies'; and the descriptions given of the larva by many are so variable that they are equally misleading—obviously the result of copying from one to the other.

October, 1901.

NOTES FROM SOUTH DEVON.

BY GEORGE T. PORRITT, F.L.S., F.E.S.

As supplementary to Mr. G. H. Heath's notes on the Lepidoptera of South Devon during August last (*ante*, pp. 267-269), it may be advisable to place on record my own and a friend's experiences there, but on another part of the coast, a month later.

Encouraged by the success of the previous year, I went down on August 30th, and remained until September 17th, my object being to take the remaining specimens necessary to fill up my series of the four rarities—*Leucania vitellina*, *L. albipuncta*, *Laphygma exigua*, and *Heliothis armigera*. In this, however, I was no more fortunate than was Mr. Heath, for of the four I only took *H. armigera*, and it was not only scarce, but in poor condition; oddly, last year this species occurred in fewer numbers than any of the others. It was clear to us afterwards, however, that lepidopterists had visited South Devon too early this year, as scarcely any of the late summer species came to the sugar during my first fortnight, but plenty of ordinary July and early August species, and they were in perfect condition. I felt sure even then that the good things would turn up later, and so it proved. I had to leave on Tuesday, September 17th, but a friend I left there continued to sugar, and on the following Monday, September 23rd, took the first two *L. vitellina*, and this species was then captured *every night that week*. *L. albipuncta* was also taken, and *H. armigera* continued to occur. Singularly *L. exigua*, which last year was taken in some numbers, and was the commonest species of the four, was not seen at all on that ground this year. *Caradrina ambigua* was fairly common all the time I was there, and continued in good condition quite a fortnight after I left; but still was by no means so plentiful as in the previous year, when almost any number might have been taken.

The more ordinary species were much the same as we took in 1900 (see Entom., Dec. 1900, pp. 326-328), though several were apparently altogether absent. *Stilbia anomala* was less numerous, but *Noctua neglecta* was, I think, commoner than in 1900. *Agrotis saucia*, though fairly common, was not so abundant as in the previous year; and the pretty *Bryophila muralis* was this year quite over on our arrival. *Calocampa vetusta* was, I think, the only new visitor to sugar, and it only occurred at near the end of my visit; as did also *Anchocelis lunosa* and *Polia flavocincta*, *lunosa* being more variable than I have ever seen it elsewhere. After I left, *Aporophyla australis*, *Epunda lichenea*, and *E. nigra* occurred, the last-mentioned in abundance. *Acidalia promutata* (*marginepunctata*) was the most noticeable geometer,

occurring on rocks all over the district. *Melanippe galiata* was also again common, but getting worse for wear. The entire absence of *Colias edusa*, which last year occurred wherever we went, was a very noticeable feature; but *Sphinx convolvuli*, not noticed in 1900, was not uncommon if one could have spared the time at dusk to work for it. *Macroglossa stellatarum* occurred about flowers and walls. Of Odonata, the pretty *Æschna mixta* was again fairly abundant; but the only other species seen was *Sympetrum striolatum*, also abundant. Of Orthoptera, a fresh species turned up in *Thamnotrizon cinereus*; and, as last year, *Locusta viridissima*, *Mecanema varium*, and *Ectobia Panzeri* all occurred at sugar, the last-mentioned in plenty. But *Leptophyes punctatissima*, which in 1900 was a common visitor with the others, was this year quite absent. *Niphidium dorsale*, which last year occurred commonly in the marsh frequented by *Æ. mixta*, was not searched for, or would probably have been found again.

Crosland Hall, near Huddersfield, Nov. 5th, 1901.

DESCRIPTION OF A NEW SPECIES OF *CRYPTURUS* FROM SPAIN.

By P. CAMERON.

CRYPTURUS FULVIPES, sp. nov.

Niger, late fulvo-maculato; pedibus antennisque fulvis; coxis nigris; alis hyalinis, stigmatibus fulvo. ♀. Long. 11 mm.

Hab. Gibraltar (*J. J. Walker, R.N.*).

Antennæ not quite so long as the abdomen, of equal thickness throughout; the scape pale yellow, black above. Head black; the face, clypeus, labrum, the basal half of the mandibles, the inner orbits, the outer almost entirely, and the lower part of the front, orange-yellow; the black on the centre of the front is narrowed on the lower part, and is united to the black on the vertex; there is an oblique black mark, narrowed above, over each of the antennæ, and two marks on the centre of the face touching the clypeus, and prolonged to the clypeal foveæ on the lower side; there is a small yellow line on the top of the vertex in the centre. The vertex is strongly and closely punctured; the centre of the front is irregularly transversely striated. Thorax black; the upper edge of the pronotum all round, two irregular marks on the base of the mesonotum, narrowed towards the base and produced on the inner side at the apex, two marks behind the centre, the scutellar keels, the scutellum, the apex of the post-scutellum, the apical slope of the median segment, the greater part of the prosternum, two large marks on the centre of the mesosternum, its sides irregularly behind, these yellow marks being continued up the mesopleuræ, where they become irregularly narrowed, and a large oblique mark on the lower part of the metapleuræ, orange-yellow. The whole thorax is closely and almost uniformly punctured. Legs fulvous; the four

anterior coxæ and trochanters are pale yellow; the hinder coxæ black, except at the base behind; the hinder trochanters yellow, the basal two-thirds of the basal joint black; the terminal joint of the hinder tarsi black. Wings hyaline; the stigma pale, the nervures dark fulvous. Abdomen black; the apices of the basal five segments broadly orange-yellow; on the apex of the sixth are two broad yellow lines; the ventral segments are irregularly banded with yellow on the apex; the apex of the last segment is brownish.

[As I am not quite sure if this species can be referred to *Crypturus*, or if it should not form the type of a new genus, I have thought it as well to give a full generic description of it. *Crypturus* is a parasite in the nests of *Polistes*. The present species has certainly a considerable resemblance to that wasp-genus.]

Parapsidal furrows obsolete. Median segment with two transverse keels, widely interrupted in the middle. Antennæ stout, as long as the abdomen, of equal width throughout; the last joint double the length of the preceding. Petiole long; the post-petiole wider than the basal joint; the whole is longer than the second segment. Wings without an areolet; the transverse cubital nervure is very short, the radial and cubital nervures being almost united; the transverse basal nervure is interstitial; the recurrent nervure is received distinctly behind the transverse cubital nervure; there is no nervure on the cubito-disco or recurrent nervures; in the hind wings the median nervure is broken above the middle. The head is broader than long; it is well developed behind; there is a long oblique slope from the ocelli behind, above the keel on the occiput, which is margined. Eyes large, slightly converging below. Clypeus short, broader than long, separated from the face; the apex is obliquely depressed, and slightly incised in the middle. Labrum large, its apex rounded. Mandibles large, the teeth large; the upper is slightly larger than the lower. Palpi large; the second joint of the maxillary is dilated. Scutellum large, flat; the basal keels broad. Post-scutellum bifoveate at the base. The spiracles linear; there is a curved keel outside them. On the centre of the median segment are two indistinct longitudinal keels running to the transverse keel. The hinder legs are much longer than the four anterior; the hinder coxæ are more than twice longer than thick; the front tarsi are twice the length of the tibiæ; the claws small, simple; the hinder tibiæ are longer than the femora; the metatarsus is longer than the other joints united. There is one spur on the front and two on the four posterior tibiæ. The spiracles of the petiole are placed beyond the middle at the base of the post-petiole; the second abdominal segment is longer than broad; the third is square; the others broader than long; the apical segment is bluntly pointed, wide, keeled down the middle above; the hypopygium is large, broad, and does not project beyond the last segment; the sheaths of the ovipositor are broad and as long as the apical segment. The four posterior tibiæ and tarsi are spinose; there is a wide shallow furrow on the mesopleuræ near the sternum; the abdomen is twice the length of the thorax; the abdominal spiracles are large and distinctly visible. There are eight abdominal segments.

SOME NOTES ON *XYLOMIGES CONSPICILLARIS*.

BY HARRIS DOIDGE.

On page 130 of the present volume you were good enough to publish a record from me of this insect in Somerset. Subsequently to the two reported, my friend Mr. Butler and I had a dozen emerge in our breeding cases.

The pupæ were obtained in a private park several miles from here, and in answer to Mr. Percy C. Reid's enquiry (*ante*, p. 157), they were dug under both oaks and elms, their presence there being probably due to the fact that their food-plant—the bird's-foot trefoil—happened to grow in immediate proximity.

After losing several in futile attempts to procure a pairing, we were at last fortunate in obtaining a fine batch of ova.

The impregnated female was placed on a growing plant of bird's-foot trefoil (*Lotus corniculatus*), but the ova were deposited in a compact batch on the leno covering instead of on the food-plant. They were laid on May 21st, and were at first nearly white, soon changing to a pale lilac shade. On May 31st the larvæ hatched almost simultaneously, and were at once placed on their food-plant. The young larvæ, which on hatching were a purplish grey colour, began feeding on the yellow flowers, and rapidly became of the same colour. After finishing the flowers they commenced on the leaves, by which time they were a pale green colour, with a yellow spiracular stripe, and were fond of resting by day on the stems of the plant. As they approached the final stage, the green became shaded with brown and black, the larvæ now bearing a remarkable resemblance to the seed pods which were ripening. This protective colouration was equally noticeable when the young larvæ were feeding on the flowers, and later, when resting on the stems. Finding a difficulty in procuring food for them, we gradually shifted them on to blackthorn, to which they adapted themselves freely, feeding by night, and hiding in crevices and under leaves by day. We found they would also eat dock and the lesser trefoil (*Trifolium minus*), the former sparingly.

About July 8th they began to go under ground to pupate. The pupæ, which were of a dark reddish brown colour, and somewhat obese and blunt, being enclosed in a very compact and brittle earthy cocoon.

We should be glad to know if this insect is as rare now as formerly, and in what localities it has been recorded of late years.

Sherford, Taunton : November 6th, 1901.

A LIST OF THE LEPIDOPTERA OF COUNTY CORK.

By C. DONOVAN, M.D., F.E.S., Capt. I.M.S., and R. J. F. DONOVAN.

As supplementary to Mr. Kane's "Catalogue of the Lepidoptera of Ireland," which has now appeared in book form, we considered our captures since 1883, in the neighbourhood of Glandore, Timoleague, and Courtmacsherry, in this county, would prove acceptable to those of your readers interested in the geographical distribution of Lepidoptera of our islands. Many of the insects procured near Glandore and Timoleague have already been included in Mr. Kane's list, but several were, for some unaccountable reason, omitted. All our specimens, except those easily recognizable and common, have been seen and verified by Messrs. Kane and Barrett, to whom we cannot sufficiently express our gratitude for the kind help they have at all times so readily afforded us. We regret our list of Micro-Lepidoptera is of such a meagre and fragmentary nature; however, one of us hopes to remedy this defect next year by giving more attention to this interesting group.

The first named of the contributors of this list collected at Glandore from 1883 to 1889, at Bandon from 1890 to 1891, and Courtmacsherry this year. The second, at Timoleague, since 1896 to the present time. Glandore and Courtmacsherry are on the sea-coast, while Timoleague is about five miles inland and the same distance from Courtmacsherry.

Occasional excursions have been made inland, as to Gougane Barra, the source of the river Lee; Dunmanway and Drimoleague, north of Skibbereen.

The abbreviations used in our list, *viz.* G., T. and C., stand respectively for Glandore, Timoleague, and Courtmacsherry.

RHOPALOCERA.

Pieris brassicæ, *P. rapæ*, and *P. napi*, common. *Euchloë cardamines*, common. *Colias edusa*, common in some years, T. and G. *Argynnis aglaia*, several. *A. paphia*, common. *Melitæa aurinia*, common in suitable localities (the type, with the handsome var. *hibernica*). *Vanessa io*, *V. urticæ*, *V. atalanta*, and *V. cardui*, common. *Pararge egeria* and *P. megæra*, common. *Satyrus semele*, common, especially on the sea-coast. *Epinephele ianira*, *E. tithonus*, and *E. hyperanthes*, common. *Cænonympha pamphilus*, common. *Thecla quercus*, common in some woods near T. and G. *T. rubi*, common, G. and Dunmanway; few, T. *Polyommatus phlæas*, common. *Lycæna icarus*, common. *L. minima*, several near C.

HETEROCERA.

SPHINGES.—*Acherontia atropos*, one larva in 1896; an imago on Sept. 20th, 1899; another on Sept. 29th, 1900, T.; a couple,

G. Sphinx convolvuli, two in Sept. 1900; a few in Aug. and Sept. 1901, T.; common in some years, G., at flowers of *Nicotiana affinis*. *Chærocampa porcellus*, few, T.; common, C. *C. elpenor*, three imagines and a few larvæ, T.; several G.; few, C. *Smerinthus ocellatus*, a few larvæ every year, T.; common in larval stage, G. and C. *S. populi*, larvæ not uncommon, T.; larvæ common, G. *Macroglossa stellatarum*, plentiful in 1899, rather scarce in other years, T.; common, G. and C., varying in numbers in different years. *M. bombyliiformis*, not common, T.; common, G. and C. *Trochilium apiforme*, common near Bandon; few, G. *Sesia musciformis*, common on rocks by the sea, between the Old Head of Kinsale and Glandore; larvæ were found in different stages of growth through the year, an occurrence that leads us to believe the larval stage lasts for two years. One of us is to give further attention in solving the life-history of this clearwing with a view of coming to a decided opinion as to the length of life of the larva. Pupæ were found from the beginning of June to the first week in July only. *Ino statice*, rather scarce, T.; common, G.; several, C. *Zygæna filipendulæ*, common.

BOMBYCES.—*Sarrothripus undulatus*, by no means uncommon, T.; one, C. *Hylophila prasinana*, common, especially in pupal stage, T. and G. *Nola confusalis*, rather plentiful, T.; common at C., quite a pest “dusking”; several, G. *Nudaria mundana*, common. *Lithosia complana*, common, C. *Gnophria quadra*, plentiful in pupal and larval stages, T.; five, G. *G. rubricollis*, formerly more plentiful than during the last year or so, T.; several, G. *Deiopeia pulchella*, one near Bandon. *Euchelia jacobææ*, abundant. *Arctica caia*, common in the larval stage. *Spilosoma fuliginosa*, larvæ scarce, one imago in 1899, T.; several, G. *S. mendica*, rather scarce, all var. *rustica*, with the exception of one intermediate between this and the type, T.; several, G. and Bandon; a few C.; all referable to *rustica*. *S. lubricipeda*, common. *S. menthastri*, very common. *Hepialus humuli*, common. *H. velleda*, scarce, T.; common, G. and C.; the var. *gallicus* fairly common. *H. lupulinus*, common. *Dasychira pudibunda*, rather plentiful, especially in larval state, T., G., and Bandon; a few, C. *Orgyia antiqua*, common, T. and G. *Pæcilocampa populi*, a few specimens in different years, T.; one near Bandon. *Bombyx neustria*, one, T. *B. rubi* and *B. quercus*, common. *Saturnia pavonia*, common on heaths. *Dicranura vinula*, common, especially in the larval state. *Lophopteryx camelina*, larvæ not uncommon, several imagines. *Notodonta dictæa*, one near Bandon. *N. ziezac*, two larvæ, T.; fairly common, G.; one at Dunmanway. *N. chaonia*, four males at light, C. (all very large and dark coloured); one female near Rosscarberry. *Phalera bucephala*, common, especially in the larval state. *Pygæra pigra*, several larvæ procured at Gougane

Barra and Pass of Keimaneigh, July 22nd, 1901. *Thyatira derasa*, fairly common. *T. batis*, common, much more so than the preceding.

NOCTUÆ.—*Bryophila muralis*, seven imagines and about five more seen on rocks by the sea, Courtmacsherry. Pupæ were found in cocoons between plants of *Armeria* and the rock adjoining. All the specimens procured were of a greyish-green colour, no marked variation; the var. *impar* not found. *B. perla*: Mr. Kane says this species is common and widely distributed, but we have secured only a single specimen this year at T. Close examination of old walls in the neighbourhood has proved unsuccessful in discovering any more. *Demas coryli*, scarce, T.; several, G.; one, C. (an especially large and dark-coloured male). *Acronycta psi*, scarce, T.; few at Glandore, near Bandon and C. *A. aceris*, there is a mistake in Mr. Kane's list about my (*C. D.*) procuring pupæ of this insect at Glandore; the pupæ alluded to produced *M. brassicæ*; I have, however, seen the conspicuous larvæ there, so the entry may stand. *A. rumicis*, common; the var. *salicis* is found commonly with the type. *A. euphorbiæ*, larvæ common in 1901 on *Plantago maritima* growing on rocks by the sea, C., in the months of June and July. The imagines emerged from these larvæ in August; this late emergence is most unusual in the British Islands. A single larva at Gougane Barra in July on *Salix cinerea*; this was unfortunately ichneumonised. *Leucania conigera*, common. *L. vitellina*, one specimen at sugar, Sept. 11th, 1901, at Courtmacsherry; the insect has been seen by Messrs. Barrett and Kane. *L. lithargyria*, common, *L. unipuncta (extranea)*, one in September, 1896, T., seen by Mr. Kane; another in the same month this year, C., seen by Messrs. Barrett and Kane. *L. littoralis*, one, G. *L. comma*, common. *L. straminea*, a single specimen near C. *L. pallens*, common. *L. impura*, common. *Tapinostola fulva*, one specimen, 1897, T. *Nonagria sparganii*, common in half a dozen marshes between the Old Head of Kinsale and Glandore. Young larvæ in *Iris*, older in *Sparganium*, and sometimes in *Typha latifolia*; pupæ invariably in the two latter plants, never in *Iris*, as far as our present experience goes. One pupa in dead stem of *Arundo phragmites*. *N. arundinis*, common wherever the food-plant exists. *Hydraccia nictitans*, common and very variable. *H. micacea*, not common, T.; common, G. and C. *Axylia putris*, fairly common. *Xylophasia rurea*, fairly common. *X. lithoxylea*, common. *X. sublustris*, one specimen, C. *X. monoglypha*, abundant and variable. *Laphygma exigua*, one imago at honeydew on lime, Sept. 8th, 1899, T. *Neuria reticulata*, three, G.; two, C. *Neuronis popularis*, common, T. and C.; several, G. *Charæas graminis*, common in some years, G. and T. *Luperina testacea*, common. *L. cespitis*, scarce, T.; several, C.; a few almost black in colouration. *Mamestra farva*, a couple, C. and

G. *M. brassicæ*, very common. *M. persicariæ*, two or three specimens; larvæ not so scarce, T.; several, G.; and about half a dozen, C. *Apamea basilinea*, common, G. and C. *A. gemina*, common, both forms exist. *A. leucostigma*, one specimen, G. *A. didyma*, very common and variable. *Miana strigilis*, common. *M. literosa*, not scarce, T.; common, G. and C. *M. bicoloria*, rather scarce, T.; common, G. and C. *Grammesia trigrammica*, common. *Stilbia anomala*, scarce, T.; several, G.; one, C. *Caradrina morpheus*, one specimen, C. *C. taraxaci*, common; very partial to flowers of *Teucrium scorodonia*. In a fairly long series obtained at C., Mr. Barrett failed to find any *alsines*. Mr. Kane says, "not apparently in great numbers;" this is not our experience, as we found it very common. *C. quadripunctata*, common. *Rusina tenebrosa*, common, T.; several, G. and C. (all the melanic variety). *Agrotis vestigialis*, a few near G. *A. suffusa*, common. *A. saucia*, common in the autumn brood. *A. segetum*, very common. *A. lunigera*, four specimens at C., at sugar in a lane about two hundred yards from the sea, with no precipitous cliffs for several miles distant. *A. exclamationis*, very common.

(To be concluded.)

SOME SYSTEMATIC WORK PUBLISHED DURING THE LAST FIVE YEARS UPON NORTH AMERICAN AU- CHENORRHYNCHOUS HOMOPTERA (RHYNCHOTA).

BY G. W. KIRKALDY, F.E.S.

1897. H. OSBORN & E. D. BALL, "Contributions to the Hemipterous Fauna of Iowa" (Proc. Iowa Acad. Sci. iv. pp. 172-234, plates 19-26).
1897. E. P. VAN DUZEE, "A Preliminary Review of the North American Delphacidæ" (Bull. Buffalo Soc. Nat. Sci. v. pp. 225-61).
1898. OSBORN & BALL, "Studies of North American Jassoidea" (Proc. Davenport Acad. Nat. Sci. vii. pp. 45-100, plates 1-6); "The Genus *Pediopsis*," and "A Review of the North American Species of *Idiocerus*" (Proc. Davenp. Acad. vii. pp. 111-38).
1898. BALL, "A Review of the Cercopidæ of North America, North of Mexico" (Rep. Iowa Ac. Sci. pp. 204-26).
1900. OSBORN, "The Genus *Scaphoideus*" (Journ. Cinc. Soc. Nat. Hist. xix. pp. 187-209, plates 9, 10).
1901. BALL, "A Review of the Tettigonidæ of North America, North of Mexico" (Proc. Iowa Acad. viii. pp. 35-75, plates 1-7).

Our knowledge of North American Tetigoniidæ (or Jassoidea,

as they are generally called in America), Cercopidæ, and Asiracinae (Delphacidæ) has of late years been considerably increased, chiefly through the labours of Van Duzee, Osborn, Ball, C. F. Baker, C. P. Gillette, and others, to a large extent, no doubt, because these insects are of some economic importance.

Seven papers by three of these authors are now noticed, not because the remaining publications during the past five years are not valuable, but because those chosen are to some extent monographic revisions of difficult and little-known groups.

Van Duzee admits twelve American genera of Delphacidæ,* with over fifty species, which will certainly be greatly extended by future workers. Of these, seven genera and four species are found also in Western Europe. Osborn and Ball have furnished detailed descriptions and valuable figures of *Deltocephalus*, *Pediopsis*, *Idiocerus*, *Agallia* (all European genera); while Osborn has revised *Scaphoideus*, a genus closely allied to *Deltocephalus*, but restricted to America. Ball has also reviewed the Cercopidæ, admitting six genera (four also West European) and sixteen species. The revision of the Tettigonidæ deals with *Tettigonia* and its near allies, *Gypona* being reserved for a future paper. Seven genera are recorded.

These seven papers comprehend some 270 pages, with twenty-three plates, the latter embracing nearly five hundred illustrations. In the attention paid to structural details (especially of the genital segments), and in the broad and philosophical view taken of "variation," the "limits of species," &c., and in the general preparation of the descriptions, I have no hesitation, having regard to the obscurity of most of the groups dealt with, in placing them as a whole in the very front rank of homopterous publications. It may be noted, as some proof of the interest taken in the Homoptera, that these authors have criticised and recriticised one another's writings very freely in the pages of 'Psyche,' 'The Entomological News,' and other publications.

Having regard to the fact that not only a number of genera, but even of species, of the Homoptera are common to America and Europe, the descriptions and detailed figures cannot but be useful to British entomologists. The papers are elucidated by copious analytical tables of genera and species; but though the black illustrations appear to be carefully drawn, coloured figures of some at least of the remarkable variations mentioned would have perhaps enhanced their value. There are many valuable observations and notes on the habits and metamorphoses of American Homoptera, which will be summarized later on in another paper.

The following is a list of the Auchenorrhyncha common to North America and Western Europe; it is probably incomplete

* The nomenclature of the several authors is employed to prevent confusion.

as regards the Membracinæ (a subfamily of Tetigoniidæ), *Typhlocyba*, and other genera, as I have none of Goding's or Gillette's later papers before me while writing.

Fam. CERCOPIDÆ.

The genera *Cercopis* (= *Philænus*), *Tomaspis*, *Aphrophora*, *Lepyronia*.

1. *Cercopis spumaria* (Linn.). Eastern Canada; the New England States; (also Japan).

2. *Cercopis lineata* (Linn.). The same American localities as the preceding.

Fam. FULGORIDÆ.

The genera *Stenocranus*, *Kelisia*, *Dicranotropis*, *Stiroma*, *Megamelus*, *Achorotile*, and *Embolophpora* (= *Liburnia*).

3. *Megamelus notula* (Germar). Ontario; New York.

4. *Achorotile albosignata* (Dahlb.). New York.

5. *Embolophpora pellucida* (Fabr.). (The northern Old World to Kamtchkatka). America, from Alaska to New York.

6. *Embolophpora obscurella* (Boheman). New York.

Fam. TETTIGONIIDÆ (= Jassoidea).

Genera *Agallia*, *Alebra*, *Aphrodes* (= *Acocephalus*), *Athysanus*, *Balclutha* (= *Gnathodus*), *Bythoscopus*, *Cicadula*, *Deltocephalus*, *Dikraneura* (= *Dicraneura*), *Dorycephalus*, *Empoasca* (= *Kybos*), *Euacanthus*, *Hecalus*, *Idiocerus*, *Ledra* [doubtful], *Macropsis*, *Parabolocratus*, *Paramesus*, *Pediopsis*, *Penthimia*, *Phlepsius*, *Platymetopius*, *Strongylocephalus*, *Tetigonia* (= *Tettigonia*), *Thamnotettix*, *Typhlocyba*, and *Ulopa*.

SPECIES.

7. *Aphrodes albifrons* (Linn.). Canada, New England States, and Michigan.

8. *A. flavostriata* (Donovan) (= *rivularis*, Germ.). Vermont.

9. *A. fuscofasciata* (Goeze) (= *brunneobifasciata* and *serratulæ*). New Jersey.

10. *A. nervosa* Schranck (*striata*, auctt.). Canada; New York.

11. *Athysanus obsoletus* (Kirschb.). Canada; New York; Iowa.

12. *A. striatula* (Fallén). Iowa.

13. *A. striola* (Fallén). Canada; New York.

14. *Balclutha punctata* (Thunberg). Canada; widely distributed in the United States to Texas.

15. *Cicadula punctifrons* (Fallén). New York; Iowa.

16. *C. sexnotata* (Fallén). Whole of North America.

17. *C. variata* (Fallén). Canada; New York; Michigan.

18. *Deltocephalus ocellaris* (Fallén). Colorado.

19. *Dikraneura flavipennis* (Fallén). Iowa.

20. *Empoasca smaragdula* (Fallén). Almost whole of North America.

21. *Strongylocephalus agrestis* (Fallén). New York; Iowa; Michigan.

A total of thirty-eight genera and twenty-one species.

A few words on the nomenclature of some homopterous genera may not be out of place here.

1. It does not seem to be generally known that Hardy's genus was *Dikraneura* (not *Dicraneura* as usually spelt).

2. In the 'Transactions' of the Entomological Society of London (1894, pp. 411-3), Mr. W. F. Kirby discusses the synonymy of two Tetigoniid genera, viz. *Cephalelus* and *Dorydium*, and concludes that the type of the latter is *lanceolatum*, Burm.

Kirby has fallen into error here through assigning a wrong date for the publication of the rhynchotal portion of Burmeister's 'Handbuch der Entomologie.' This was not 1839, as Kirby states, but 1835,* as far as pp. 1-396 are concerned; pp. 1005-17 were indeed published in 1839. *Cephalelus* was founded in 1832 by Percheron in Guérin's 'Magazin Zool.,' type *C. infumatus*. In 1835 Burmeister ('Handbuch,' ii. p. 106) erected *Dorydium*, type *paradoxum*. In 1838 the same author ('Genera Insectorum') stated that these two genera were founded on the same insect, and transferred the name *Dorydium* to a new species, *lanceolatum*, and this was also noted in 1839 in the table of corrections, &c., appended to vol. ii. of the 'Handbuch' (p. 1006).

The following synonymy will therefore be necessary:—

- (1.) CEPHALELUS, Bercheron, 1832, type *infumatus*, Perch.; Signoret, 1879, Ann. Soc. Ent. France (5), 9, p. 259.
= *Dorydium*, Burm., 1835, type *paradoxum*, Burm.
- (2.) PARADORYDIUM, n. n., 1901, type *lanceolatum* (Burm.).
= *Dorydium*, Burm., 1838 and 1839, type *lanceolatum*, Burm.; Signoret, l. c. p. 261; Kirby, 1894, l. c.; Puton, 1899, Cat. Hémipt. paléarct., ed. 4, p. 93.
- (3.) Gen. nov. ? (type *westwoodi*, F. B. White).
= *Dorydium*, F. B. White; Signoret, 1880, l. c. (5), 10, p. 43.

3. The first palæarctic genus of the Agallini (Bythoscopini) founded was *Agallia*, Curtis (Jan. 1833), type [*consobrina* . .] *puncticeps*, Germ. In the same year (July or after) Germar erected *Bythoscopus*, no type being fixed. In 1835 Lewis proposed three genera: (1) *Batracomorphus*, type [*irroratus* =] *microcephala*, Schöff.; (2) *Macropsis*, with two species *virescens* (Fabr.) and *flavicollis* (Linn.); and (3) *Idiocerus*, the application of which is not disputed. He also fixed *lanio* (Linn.) as the type of *Bythoscopus*, Germ. In 1838 Burmeister ('Gen. Insect.') divided *Bythoscopus* into four subgenera: (1) *Bythoscopus*, not that of Germar, restricted by Lewis; (2) *Idiocerus*; (3) *Oncopsis*, Burm.

* See, amongst other contemporary references, Burmeister, 1836, Arch. Naturg. ii. pt. 2.

part of *Macropsis*, Lew., in which is included *Macropsis flavicollis* (Linn.), Lew.; and (4) *Pediopsis*, Burm. = part of *Macropsis*, Lew., with type *Bythoscopus tiliæ*, Germ.* As *lanio* is scarcely to be separated generically from *microcephala*, Schöff., *Batracomorphus* becomes a synonym of *Bythoscopus*, Germ., Lew. In 1843 Amyot and Serville ('Hémiptères') named *lanio* as the type of *Macropsis*, notwithstanding that it did not conform to Lewis's description, and had already been fixed as type of *Bythoscopus* by Lewis. The type of *Macropsis* has, in fact, never been properly fixed. It must be either (1) *flavicollis* or (2) *virescens*. I now fix it as the former as least objectionable. The name *Macropsis*, Lewis, cannot be used for *lanio* and its congeners, because it was, as stated above, founded for two species only, neither of which belongs to the same genus as *lanio*. The synonymy will then be:—

- (1.) BYTHOSCOPIUS, Germ., 1833, type *lanio* (Linn.), Lewis.
 = *Batracomorphus*, Lewis, 1835, type [*irroratus*,
 Lew. =] *microcephala*, Schöff.
 = *Macropsis*, auctt.
- (2.) MACROPSIS, Lewis, type *flavicollis* (Linn.), Kirk.
 = *Oncopsis*, Burm., 1838, type *tiliæ* (Germ.), Burm.
 = *Bythoscopus*, auctt.

4. Van Duzee adopts the generic name *Liburnia*, Stål, for *pellucida*, &c. He is certainly correct in not employing *Delphax*, Fabr., as has Puton in the fourth edition of the Catalogue of Palæarctic Rhynchota.

The type of *Delphax* must be either *Cicada clavicornis*, Fabr., or *Cicada crassicornis*, Fabr., for these two were the only species included in the genus at its foundation in 1798. The former was fixed as the type of *Asiraca*, Latreille (1796), in 1810. I have not yet been able to trace a proper type-fixation for *Delphax*. *Liburnia*, Stål, 1866, is preoccupied by *Embolophora*, Stål, 1853 (not *Embolophora*, as Stål himself writes it later), and the latter name should be used. The somewhat complicated synonymy therefore stands:—

- (1.) ASIRACA, Latr., 1796, type *clavicornis* (Fabr.), Latr., 1810.
 = ? *Delphax*, Fabr., 1798 (typical).
- (2.) ARÆOPUS, Spinola, 1839, type *crassicornis* (Fabr.), Spin.
 = ? *Delphax*, Fabr. 1798 (typical).
- (3.) EMBOLOPHORA, Stål, 1853,
 = *Liburnia*, Stål, 1866.
 = *Delphax*, mod. auctt.

* "Ab omnibus speciebus hujusce sectionis hæc optime cum caractere subgeneris congruit."—Burm. l.c.

SELENIA ILLUSTRARIA (TETRALUNARIA) AND ITS BROODS.

By F. MERRIFIELD, F.E.S.

MR. GARRATT'S experience, as given in your October number (*ante*, p. 288), is not an uncommon one. Sometimes a whole brood, hatched from the egg in May, will "go over" until spring, more often only a few of them. When a brood "splits" in this way, those which go over are always on the average much larger than those which emerge in July. This is no doubt because there is a similar difference in size between the natural spring emergence and the natural summer emergence; and the larvæ which go over belong physiologically to the spring form, one of the attributes of which is largeness. Experiments tried by me on a large scale have shown that the question to which of the two forms—the large spring one or the small summer one—the individual will belong is decided in a very early period of the larval life, but not—at all events unalterably—earlier. I have had, by forcing from the beginning of the oval stage, five generations in the year, of the allied species *S. bilunaria* (*illustraria*), all of the summer form, but have not been able to thus change the destination by forcing half-grown larvæ or pupæ. I had some large broods this year of *S. tetralunaria* larvæ, from eggs laid by the summer emergence early in July, which were beginning to pupate just before I went abroad on Aug. 16th, and when I returned on Sept. 20th I found many more had pupated, and by the beginning of October almost all had done so, giving me nearly 170 pupæ. Those which pupated before and during my absence had been placed in a refrigerator, as I felt sure some would otherwise emerge before my return. When nearly all had pupated—about a fortnight since—I picked out twenty-four, which I judged from their small size to belong to the summer-emerging division, and forced twelve of them. All but two of the largest of these emerged (except two which died) in less than a week. These two largest, after a fortnight's forcing, are lively, and show no signs of approaching emergence, so I have added them to the majority, which will remain in pupa until next spring unless I force them; and this, my experience tells me, it will be of no use to do until about January. It may be of interest to mention that the individuals belonging to this major division are of very large size, averaging in weight: males, .3112 gramme (nearly 5 grains); females, .3900 gramme (over 6 grains). I have two other broods of practically the same weight; the heaviest individuals are: males, .3900 gramme; females, .5300 gramme (about 8 grains). I have no doubt that these results are owing to my having crossed individuals from Germany with some from England, for they are more than 50 per cent. heavier

than the pupæ from which their English and German grandparents came last spring. Possibly this increase of size is in a slight degree owing to my having given the larvæ a considerable change of diet, which I have found very useful in checking the deterioration caused by breeding in and in. This is quite in conformity with what might have been expected, in accordance with the views of Darwin and Wallace, as to the advantages arising from a change of physical conditions. I add that the benefit of crossing, &c., showed itself in the summer emergence, the pupæ of which were nearly as heavy as those of their English and German parents.

24, Vernon Terrace, Brighton: Oct. 13th, 1901.

A NEW LAC-INSECT FROM SOUTH AFRICA.

By T. D. A. COCKERELL and G. B. KING.

Tachardia actinella, n. sp.

♀. Scale about 3 mm. long, 3 broad, and scarcely 2 high, rounded and depressed, dark crimson, with about sixteen strong but obtuse radiating yellowish white ridges; centre of scale formed as in *T. decor-ella*. The scales are mostly separate, but sometimes two or more coalesce.

♀. Dark red, $2\frac{1}{2}$ mm. long, $1\frac{1}{2}$ broad; bright pink when boiled in caustic potash; this colour is due to the internal juices, the skin being perfectly colourless. Antennæ stout, cylindrical, pale, about 140 μ long, 52 broad at base, 36 in middle, 28 at end, obscurely four-jointed. Lac-glands with over 60 orifices. Mouth-parts about 141 μ broad. Spine well-developed, 120 μ long, rapidly enlarging 36 μ from tip to a very broad (95 μ) base. Anal ring with 10 long bristles; chitinous anal plate roughly semicircular, posteriorly with a deep linear incision 60 μ long; on each side of the anal plate is an elongated process terminating in two sharp spines, the structure being apparently the result of a fold in the plate. Anteriorly, the anal plate is tuberculated.

♂. Scale cylindrical, elongated, of the usual form; dark red.

Hab. Natal, on bark of undetermined tree; uncommon (*Claude Fuller*, No. 19). The scale might be taken for *T. decor-ella*, Maskell, but that Australian species has no antennæ, and the spine (according to Maskell's figure) is not broadened at the base.

INSECTS IN NORFOLK BROADLAND IN JUNE.

BY ERNEST A. ELLIOTT, F.E.S., AND CLAUDE MORLEY, F.E.S.

WE had long promised ourselves a little collect in the Norfolk Broads, from which great things were, judging from our experiences south of the Waveney, to be expected, and, as a sequel, found ourselves in Norwich on the 9th of last June. Thence we started on a glorious, breathless morning to easily jog wherever the caprices of the erratic bike might chance to land us, ready to collect an hour or so at any likely spot upon the route. And they were not wanting: Surlingham Broad, Rockland Marsh, and Buckenham Ferry are splendid ground, and very hard to beat entomologically. Tea-time found us at Acle, and the next morning we limbered up in a gale, and sallied forth in its teeth with a leaden sky above us; the sampling of Filby, Rollesby, and Ormesby Broads became a trying matter with a wind that followed your net and emptied its contents as soon as captured. Thence we came down to Caister, *viâ* its grand Castle, for letters and lunch, reaching Winterton by the coast-road during the afternoon. The sandhills would doubtless be very prolific on a calm day. These elemental conditions continued on the 12th with the happy change of a much lower temperature. At Horsey the road deserted us, and the machines objected to move with any attempt at rapidity over the cracked, baked edges of the dykes till we encountered a hedge, and took more of it away than we could have wished—in our tyres. A weary drag over Brograve Level to Stub's Mill was tempered by lunch at Hickling Green, and we at length put into Stalham in a downpour. The grass was still wet when we tried to ride over a two-feet growth of it in a futile attempt to cross the Ant next morning, having eventually to detour to South Small-borough, on Barton Broad, which we agreed would be a fine locality when it was not raining with less than 50° F. Wroxham Broad was never moister than on the 14th, and we feared the sheets of water falling into it might cause an overflow, so trained to Norwich. But it looked brighter beneath a gorgeous sunset, and the Hoveton Marshes yielded several captures of note. Then the rain-god desisted, and Horning, St. Benets, Ranworth, Salhouse, and Woodbastwick next day made pretty pictures, typical of Broadland, when one managed to run out from behind the scenes, where nestle the villages and their attendant roads. The "Bell" at Norwich saw us back at night, and the next day streaming through Attleborough, on a puncture, to the home of the flint-knappers.

Thanks to the pluvial inclemency of the weather, insects were very scarce and generally of the commonest, though a few interesting species of every Order put in an appearance. The

Coleoptera comprised *Anchomenus gracilis*, Rockland, and *A. thoreyi*, Ormesby; *Laccophilus interruptus* and *Coccinella 19-punctata*, at Horsey; *Psammæchus bipunctatus* and *Anomala frischeri*, a pupa of which latter had been blown out of the sand and was lying quite exposed in a little hollow, at Winterton; *Campylus linearis*, at Surlingham, with *Silis ruficollis*, which was also common at Rockland and Horning. At the latter locality, *Telephorus figuratus* and *Malthodes dispar* also occurred with *Cryptorhynchus lapathi*, sitting on a gate-post; *Calandra oryzae*, beneath a board by a marsh hay-stack in the open levels; *Galeruca tenella*, *lineola*, *sagittariae*, and *nymphææ* (which last was in the flowers of *Nymphæa lutea*), *Psylliodes dulcamaræ* and *picina*, *Donacia clavipes* and *comari*. *D. affinis* and *semicuprea* and *Gymnetron pascuorum* were found at Rockland, and *Crypticus*, *Microzoum*, with other coast species, at Winterton. *Eirirhinus nereis* turned up at Wroxham, and *Crepidodera modeeri* in the Horsey Marshes. Such aristocrats as *Donacia impressa* and *menyanthidis*, the Lixi, and other specialities of the Broads, could not be expected to turn out in the rain and cold winds, nor, needless to add, did we see *Ceuthorhynchus querceti*.

Great numbers of Hymenoptera were taken, more especially among the Ichneumonidæ, which we were more particularly anxious to work, but of these we will only notice *Ichneumon albicinctus* at Eaton; *Phæogenes collaris* on Mousehold Heath; *Collyria calcitrator* commonly with its host, *Cephus pygmæus*, at Filby Broad on the margin of a wheat field; *Tryphon scotopterus* (which Bridgman had described as a new species under the name *Perilissus fumatus* from the vicinity of Norwich—cf. Entom. xiii. p. 54) occurred in a chalk-pit at Earlham; *Bassus lætatorius*, at Filby. Mr. Nevinson, whom we had the pleasure of meeting, showed us several *Rhyssa persuasoria*, taken in the act of ovipositing in the burrows of *Sirex gigas* at Horning. *Rhogas circumscriptus* was swept at Eaton, and the curious little *Perisemus triareolatus* at Wroxham. The Tenthredinidæ were in great force all along the line. *Tenthredo atra* at Eaton and Rockland, *T. moniliata* (female) at Rockland, and *T. punctulata* at Hickling; *Tenthredopsis tiliæ* at Earlham; *Macrophya 12-punctata* was common at Surlingham and Rockland, and at the latter we took a male of the rare *M. albicincta*; two or three common Doleri, with *Selandria morio*, turned up at Rockland and Horning; a nice *Pæcilosoma*, probably *excisum*, Thoms., at Eaton, and *P. liturata* (= ? *guttatum*, Fall.) at Wroxham and ? Horning; we swept *Eriocampa annulipes* from the Winterton hedges, *Bleniocampa albipes* at Eaton, *B. fuscipennis* at Surlingham and Hickling, *B. ephippium* and *Emphytus calceatus* at Rockland; *Dinura stilata* was found at Wroxham, *Nematus ribesii*, which is apparently very rare in Suffolk, at Winterton, *N. abdominalis* (female), at Hickling, *N. fulvipes*, at Wroxham and Horning,

and *N. ? salicis-cinereæ* at the latter Broad; *Cephus pygmæus* was generally common, and the fine *C. linearis* occurred in the wet places at Surlingham and Rockland. Both sexes of *Sirex gigas* were cut from their borings in a pine-shed at Horning Ferry. We saw very few Aculeata, and those were common things:—*Crabro clavipes* (female) at Surlingham, *C. peltarius* at Attleborough, flying to nest in telegraph-pole; *Odynerus parietum* at Ormesby and on the Buckenham pontoon; the only bees were *Halictus leucopus* and *H. cylindricus* at Winterton and Hickling, respectively, with *Andrena minutula* (female) at Ormesby, and *H. albipes* at Hickling.

Lepidoptera we studiously avoided, annexing only a solitary *Ino statices* at Rockland. Only in one place did the glorious *Papilio machaon* appear, and we feasted our eyes, forbearing to strike so grand a friend.

Many good marsh things occurred among the Diptera, but here again the weather was all against us. *Odontomyia tigrina* was swept at dusk at Wroxham, *Microchrysa flavicornis* and *polita* common at Hickling, *Beris vallata* at Horning, a male *Hæmatopota pluvialis* swept at Surlingham, and a male *Chrysops relictus* on reeds at Horsey; *Dioctria rufipes* at Earlham and Rockland, and *Dysimachus trigonus* on the Winterton sand-hills, where also were secured two conspicuous grey Tachinids, which have baffled even Mr. Piffard's attempts to determine. Dolichopids were, of course, abundant throughout the district. *Pipunculus confusus* at Horning; *Chrysogaster hirtella* (*macquarti*) was common, and *Liogaster splendida* not rare at Horning and Wroxham; *Leucozona lucorum*, which does not abound in Suffolk, was found at Earlham; *Pyrophæna* * *ocymi* was generally common; one example of *P. rosarum* at Wroxham, with *Platycheirus fulviventris*. *Eristalis sepulchralis*, far from farm ponds, turned up not rarely at Horning and Surlingham, at the latter of which was also *Helophilus lineatus* (male, female), with *H. versicolor* at Rockland. One of the most abundant flies was *Tropidia milesiformis* in all the marshes. *Ceromasia ? spectabilis* swept from reeds at Horsey; *Morinia nana* at Wroxham; *Polietes lardaria*, in which we thought to have a prize, on the wall of St. Benet's Abbey. The fine *Hyetodesia errans* along the Yare, and *H. ? variabilis* at Horning. *Melanocheilia riparia* turned up at Hickling, *Hoplogaster mollicula* at Surlingham and Horning, and *H. bicolor* at Wroxham; *Cordylura albipes* at Rockland, and *C. ? apicalis* at Surlingham. Both *Sciomyza albocostata* and *Sepedon spinipes* were swept at Horning, with *Calobata petronella*, *Ceroxys crassicornis*, and *Notiphila uliginosa*, which last was abundant in flowers of *Nymphæa lutea*. The pretty little *Pteropæctria frondescentiæ* from Hickling is the only other species worthy of note.

* Both the British species of *Pyrophæna* have occurred to me much more freely this year in various parts of the country than during any previous experience. Am I alone in this observation?—C. M.

No mention should be made of the Hemiptera were this an attempt at a representative list, though one or two exclusively marsh things, such as *Cymus glandicolor* at Wroxham and Rockland, *Acompus rufipes* at the former, and *Plociomerus fracticollis* at the latter, did happen to fall to our lot; for the rest, *Nysius thymi* occurred at Eaton, *Psallus varians* near Attleborough, and a curious little beast that Mr. E. A. Butler thinks must be the developed form of *Plagiognathus saltitans* on the Winterton sand-hills. The common *Bythoscopus flavicollis* was beaten from bushes at Hickling, with *Eupteryx atropunctata* at Horning.

The Neuroptera were yet more disappointing, for more was expected of them than *Ischnura elegans*, which literally swarmed everywhere, and of which both the female forms were taken; *Colpotauius incisus* and *Chrysopa perla* were also found. The only uncommon Trichopteron was *Limnophilus hirsutus*, which was not rare, with *L. sparsus* on alder trunks at Rockland. *Cloëon dipterum* flew on to my coat, and was easily boxed without dismounting at Acle Bridge, while *Orthetrum cancellatum* was swept up at dusk in the Hoveton Marshes.

With a genial atmosphere the result would doubtless have been more congenial, and the real less unlike the ideal to which we, in our innocence of previous experience, had aspired; nevertheless the game was doubtless worth the candle, the length of which becomes considerable at Broadland hostelrys!

41, Holland Park, W.: Nov. 1901.

UNDESCRIBED INDIAN RHYNCHOTA: PENTATOMIDÆ.

BY W. L. DISTANT.

BONACIALUS, gen. nov.

Body elongate; head large, longer than broad, somewhat broadly rounded in front, distinctly depressed before apex, the lateral margins a little amplified and recurved, the lateral lobes longer than the central lobe and meeting beyond it, but a little cleft at their apices, the antenniferous tubercles remote from the lateral margins, and distinctly inside the longitude of the eyes; antennæ five-jointed, first joint short, incrassated, second joint not reaching apex of head, third shortest; rostrum reaching the posterior coxæ; eyes touching the anterior angles of the pronotum; pronotum broader than long, lateral margins a little sinuate, lateral angles rounded; scutellum more than half the length of abdomen, narrowed towards apex; corium with the lateral margins almost perpendicular.

This genus, by the position of the antenniferous tubercles, must be placed in the division *Dymantaria* of the subfam. Pentatominae, a division only hitherto considered as containing Australian and Ethiopian genera.

Bonacialus Dixoni, sp. n.

Ochraceous, very coarsely darkly punctate; head with the central lobe and base more or less levigate; pronotum with the margins narrowly levigate, the lateral areas more thickly and the central area much less punctate; scutellum with a large levigate spot near each basal angle and a central levigate fascia not quite reaching apex; corium thickly punctate, with its lateral margins very narrowly levigate; membrane pale hyaline; body beneath as above, the legs impunctate, a small black spot at bases of coxæ, a similar spot near apices of femora beneath, and the stigmata, black; lateral areas of the abdomen less punctate than on disk; antennæ darker ochraceous, apex of rostrum piceous. Long. 11 millim. Exp. pronot. angl. $4\frac{1}{2}$ millim.

Hab. Bombay Presidency; Bor. Ghat. (Victoria and Albert Museum).

Gulielmus, gen. nov.

Body elongate; head large, longer than broad, narrowing to apex which is subacute, distinctly depressed before apex, lateral lobes much longer than central lobe and meeting beyond it, their apices slightly cleft, antenniferous tubercles remote from the lateral margins, distinctly inside the longitude of the eyes, antennæ five-jointed, basal joint incrassated, second joint not reaching apex of head, fourth joint a little shortest; rostrum about reaching posterior coxæ; pronotum broader than long, lateral margins obliquely straight, lateral angles rounded; scutellum long, broad, a little narrower at its apical half, extending to or reaching a little beyond the apical angles of the corium; connexivum exposed.

Allied to the preceding genus *Bonacialus*, from which it differs by the differently-shaped head, pronotum and scutellum, &c.

Gulielmus laterarius, sp. n.

Ochraceous, thickly and darkly punctate; corium tinged with carmine-red; extreme margins of head and a small spot at apex of scutellum, black; two small obscure fuscous spots on anterior area of pronotum; scutellum with an elongate levigate spot outwardly margined with black at each basal angle and a central levigate line; corium with the outer margin and veins ochraceous; membrane pale greyish; inner margin of connexivum piceous; body beneath ochraceous, head and sternum somewhat thickly, abdomen more sparingly punctate, a longitudinal black punctate fascia on each lateral area of the abdomen; apex of rostrum, and apical joint of antennæ—excluding base—fuscous. Long. 9 to 10 millim. Exp. pronot. angl. $3\frac{1}{2}$ to 4 millim.

Hab. Bombay Presidency; Bor Ghat. (Victoria and Albert Museum).

Gulielmus marmoratus, sp. n.

Closely allied to the preceding species, but differing by having the surface of the pronotum and scutellum distinctly rugulose, the scutellum distinctly broader, the corium concolorous, and the punctures more profound. Long. $8\frac{1}{2}$ to 9 millim. Exp. pronot. angl. $3\frac{1}{2}$ millim.

Hab. Bombay Presidency; Bor Ghat. (Victoria and Albert Museum).

NOTES AND OBSERVATIONS.

ACHERONTIA ATROPOS IN SOUTH AFRICA.—Relative to the note on the rearing of *Acherontia atropos* (*ante*, p. 227), I should like to give my experience with the species in this country. I may first of all mention that the insect is certainly double-brooded, and possibly there are three broods in a year; also that by far the greater number of the larvæ I have found (at least thirty) are of the brilliant yellow form. Last January I found fourteen nearly full-grown larvæ, and after allowing them to pupate, I did as collectors often do in England, turned up the pupa out of the soil. All were perfect, except one crippled in changing, and two others which were evidently ichneumonated, as I found them almost rotten and covered with maggots. From the eleven perfect pupæ I only obtained two perfect specimens and one cripple; all the others died. In May, 1901, I had seven fine full-grown larvæ, which I put in a large five-gallon paraffin tin, with at least ten inches of slightly moist sand; all these went down to pupate by May 26th, and were left undisturbed. The result has been most satisfactory, as I have reared all, and only one was slightly crippled. They all came out in September: two on the 7th, one on the 9th, the cripple on the 13th, one on the 16th, one on the 19th, and one on the 20th. All the specimens are slightly smaller than my British ones, but this may be because they are the second brood. I do not know how it would answer in England to leave the pupæ alone, but here it is certainly better not to disturb them. The two perfect specimens which I bred from the January lot emerged, one on the 18th and the other on the 25th of February, and were only in the pupa state about twenty-one days; the second lot were about four months. Of course there was no forcing here, and I did not even damp the sand at all, in fact the tin was not moved until all the moths had emerged. On turning out the sand I found the empty cells were almost on the bottom of the tin, and there was at least ten inches of sand in the tin; this gives some idea of the depth these larvæ will go. In all cases where the cells were not entirely destroyed when turning out the sand, they seemed much larger than necessary for the pupæ. I may also mention that I never heard the slightest sound from the eleven pupæ I turned up, and, with the exception of one that was ichneumonated, found last year, I have not heard any sound from the larvæ. Food-plants here are numerous. I fed the larvæ I had upon sweet potato and tomato leaves, but they also eat a very large-leaved thistle, and a small-leaved climbing plant. I have also found one on a kind of bramble. In any case the larvæ are very common, and considering that so many are the very conspicuous yellow form, I wonder they are not more ichneumonated than they are. I tried to get a pairing, keeping two males and a female alive for that purpose, but without success; I fed them on moist sugar and a little water. All these three cried together, whenever I went to the box they were in, and they are alive now at the time of writing.—G. F. LEIGH; Musgrave Road, Durban, Natal, Sept. 21st, 1901.

GYNANDROMORPHISM IN LEPIDOPTERA.—A theory was put forward by Herr Dorfmeister (Stett. Ent. Zeit., 1868, p. 181) that a mixture of the

sexes takes place whilst the ovum is being developed, that is to say, part of a male and part of a female germ come together in the formation of the egg which is destined to produce a gynandromorphous specimen of Lepidoptera. Consequently, he supposes that whenever one such specimen is produced in a brood, there should be another similar one resulting from the other parts of the two germs. As a test of the soundness of his hypothesis, he suggested that experiments should be tried by breeding whole broods from the egg of such species as *Ocneria dispar* and *Lastocampa quercifolia*, of each of which several gynandromorphous specimens have been recorded. The results obtained by Messrs. Harrison and Main, who, it will be remembered, reared no less than seven gynandrous specimens of *Amphidasys betularia*, together with some sixty normal male and female examples, from one batch of ova (*ante*, p. 203), would seem to indicate that Dorfmeister's theory is worthy of more attention than it seems to have received. A significant fact is, that of the seven gynandrous examples four are male on the right side and three are male on the left side. With regard to the term "hermaphrodite," so often used in referring to specimens of Lepidoptera in which the colours and ornamentation of both sexes are represented, the late Prof. Westwood (Trans. Ent. Soc. London, 1880, p. 113) remarked:—"The term Gynandromorphism was first applied by M. Lacordaire to supersede in Entomology that of Hermaphroditism, the latter term being more strictly applicable only to those animals in which the generative organs of both sexes are normally included in the same individual, but which, nevertheless, require the presence of a second individual of the same species to effect the joint impregnation of the two individuals. In insects, gynandromorphous specimens, partaking abnormally of the character of both sexes, are generally bilateral; the sexual distinctive characters (which are for the most part in these instances the *secondary* ones) of one sex being exhibited on one side of the body and its organs, and the peculiarities of the opposite sex being seen on the other half of the insect. Of this bilateralism many instances have been recorded, and most extensive collections can boast of the possession of one or more of such 'half and half' monsters. Here the gynandromorphism may be termed *complete*, but specimens of far greater rarity, in which the abnormality is only *partial* (of which no notice occurs in any of the hitherto published introductions or general works on the science), are now known; and in my *Thesaurus Entomologicus* I collected together a number of instances in which, whilst the body of the insect appears to be unisexual, the partial sexual divarication is confined entirely to the *secondary sexual characters* exhibited by one or more of the wings only. The peculiar import of this strange modification, in a physiological point of view, is very difficult to be understood, and from the great rarity of the individuals, and their small size, we can hardly hope to obtain specimens sufficient for the necessary examination of the characters of the primary and internal sexual organs."

NOTES ON THE LARVA OF EUPITHECIA SUBFULVATA.—*E. subfulvata* is not an uncommon insect; but, like other "pugs," it is by far the best when bred, and it is possible that some of your readers may care for a few hints on the way to find the larva. I was first introduced to it

years ago by my friend the late Rev. G. A. Smallwood, in company with whom I found it on a railway embankment between Burton-on-Trent and Derby; and this year I have again found it in Shropshire. The larva feeds on the leaves of the common yarrow (*Achillea millefolium*), and is full-grown during the month of October. It is light brown in colour, somewhat variable, but generally having "chevrons" of a darker brown along the back. Mr. Smallwood led me to think that it preferred to rest upon the flowering stems, but this I find on a closer acquaintance is by no means always the case, as I found it here stretched at full length along the midrib of a leaf, and in some cases on withered leaves, in which position of course it is anything but conspicuous. And sometimes, too, it curls itself into that graceful shape known, I believe, as that of the "*ionic volute*," this being especially the case when it rests on the flowering-stems. Sunny banks under hedgerows, particularly where the soil is sandy, appear to be the favourite locality, and it was in such situations that I found most of mine this month, though I went rather too late, *viz.* on the 23rd; and there was plenty of evidence that I should have done much better a week or ten days earlier. However, this will be a hint for another season, and I hope to profit by it. Perhaps some of your readers, especially among the younger "hands," may do the like. I should like to add that this larva presents a striking example of "protective coloration," its appearance both when curled up and stretched out at full length being remarkably like that of the brown and withered leaves so frequently seen upon the plants of yarrow.—(Rev.) CHAS. F. THORNEWILL; Calverhall Vicarage, Whitechurch, Salop, Oct. 24th, 1901.

EVOLUTION IN BUTTERFLY SCALES.—At a meeting of the Manchester Microscopical Society, held on November 7th, at the Grand Hotel, Manchester, Mr. Mark L. Sykes, F.R.M.S., read a paper on "Evolution in Butterfly Scales." With reference to butterflies, he said that in whatever direction the mimicry may tend, whether in simulation of inanimate objects, such as leaves or twigs or moss, for concealment from their enemies on the one hand, or to enable them to more easily secure their prey on the other—in mimicry of conspicuously marked or highly-coloured inedible by edible species, in resemblance between two or more equally distasteful but entirely different species, or whatever purpose the mimicry may serve—it seems that the resemblance is in outward appearance only. Although the similarity in colour pattern and markings may be so close as to be almost identical, microscopical examination of the wing scales of these insects shows that the details by which the likenesses are brought about may be, and often are, widely different. The specimens from which the examples have been taken fall under two groups of mimicry—that of Müller and that of Bates. The Müllerian form of mimicry is that in which two or more highly coloured, conspicuously marked, or peculiarly shaped butterflies, all inedible and distasteful to the insect-eating animals, are so closely alike as to be easily mistaken one for the other. These by their similarity in appearance afford each other mutual protection, by dividing between them the total number destroyed by the young insectivora of each season in learning what is and what is not good for food. The Batesian mimicry is that in which certain of the con-

spicuous and nauseous species, which the young birds, &c., quickly learn are distasteful, are simulated by others which are not nauseous, but which have acquired the colours and markings of inedible forms, and are thereby protected. Amongst the former are the *Heliconinæ*, *Danainæ*, and *Acraeinæ*, all of which include amongst their members great numbers of highly coloured species, conspicuous for their markings in red, yellow, black, and blue, with a variety of intermediate tints and shades, and which are easily distinguished in their surroundings. In the latter are included butterflies of nearly every sub-family, and some of the diurnal moths, and both are found nearly all over the world. But on examining, with the microscope, the scales on the wings of these mimetic butterflies, it will be found that, so far from the similarity in superficial appearance being produced by similarity in detail and pattern, there is a wide diversity in scale-structure and arrangement. The scales vary not only in number, but in size, colour, and form, and this is the case even where one inedible species mimics another.

CAPTURES AND FIELD REPORTS.

PIERIS DAPLIDICE IN SUSSEX.—While collecting on the downs near Brighton, on Aug. 20th last, I took a fine male *P. daplidice* on the wing. On Aug. 21st I revisited the same spot, and took a very ragged female specimen. Three days later I took another fresh male example, not far from where the others were taken. Both the males are in perfect condition, but the female has not a single perfect wing. All three I observed and took on the wing.—H. HYAMS; 24, Bloomsbury Place, Brighton.

ARGYNNIS AGLAIA VAR. CHARLOTTA.—On July 7th last, while collecting on the downs near Brighton, I had the good fortune to take a fine *A. aglaia* var. *charlotta*.—H. HYAMS; 24, Bloomsbury Place, Brighton.

COLIAS HYALE, C. EDUSA, &C., AT FOLKESTONE.—The small visitation we had here of *C. hyale* this season seems to have confined itself to the grassy hillsides on the downs. They were not numerous, even in August, and I did not see one in the clover or lucerne fields in which there were so many last year. On Oct. 10th I found it again on the downs here, and I saw several males and one female; I went home for my net, and succeeded in taking two males, one of which was perfectly fresh and lately emerged, the other very slightly chipped. They must, I think, have all emerged since the wet and stormy weather which ended on Oct. 18th, and were probably a third brood. Is not this unusual in *C. hyale*? On Oct. 22nd some were still there, and again on the 23rd, on which day I saw two *C. edusa*, the only examples I have seen here this season. One I took was rather worn, and I released it. Here we occasionally have an autumn emergence of *Lycæna minima*: I took several, rather small and pale, on Aug. 21st, 1900. I took also *Nisoniades tages* here on Aug. 9th last, in fairly good condition, but small and pale. — PERCY E. FREKE; 7, Limes Road, Folkestone, Oct. 30th, 1901.

ABERRATIONS OF COLIAS HYALE AND GONOPTERYX RHAMNI.—I have recently added to my collection a remarkably interesting *C. hyale* ab.; all the usual black markings are replaced by a pale bright lilac shot with gold, producing a fine opalescent effect; the central spot on the secondaries is of a richer orange than in normal specimens; the usual dusky markings on the under side are in this specimen rose-pink, and the antennæ, costal and hind margins are of a brighter pink. It is a male, with a bright yellow ground colour, in very perfect condition, obviously freshly emerged. This beautiful insect was captured Sept. 1st last, at Sheerness, Kent, by Mr. E. Griffiths, who most kindly presented it to me. I am also indebted to him for a very fine *Gonopteryx rhamni*, which he likewise captured at Sheerness, on Aug. 28th, 1900. It is a male, having the right secondary of female colouring, excepting a narrow streak of yellow of the male running across the centre of the wing from the base to hind margin; the under side of the left primary is also of female colouring. Unfortunately, this rare specimen got considerably damaged in transit through the post, but with care I have been able to restore it to a very fair example.—F. W. FROHAWK; November, 1901.

ARGYNNIS LATONIA IN DORSETSHIRE.—A specimen of *A. latonia* was taken near Poole last season, by Mr. R. L. Thompson, of Warwick.—G. E. J. CRALLAN; Bodorgan Manor, Bournemouth.

VANESSA ANTIOPA IN HUNTINGDONSHIRE.—While collecting in Huntingdonshire, on a very hot day in July, I happened to go into a wayside inn for some light refreshment. The publican, seeing my net, said he had got "two butterflies." He fetched the nail-box, in which he kept them, and lying among the nails were *Vanessa antiopa* and *Chærocampa elpenor*. The publican informed me that he had caught *antiopa* in his garden the year before, "when the fruit was ripe." Considering the box it had been kept in, it was in remarkably good condition. It had been caught by the rough and ready method of a hat.—W. G. THEOBALD; Wolverhampton.

CHRYSOPHANUS PHLOEAS VAR. SCHMIDTI NEAR PAISLEY.—A good specimen of this little butterfly, with the ground colour of the wings white, instead of the usual copper tint, was taken near this town last September. I see the same variation referred to by Newman. The specimen was in my possession for a few days and was exhibited at our local societies' meeting in October.—A. M. STEUART; 28, Ferguslie, Paisley, N.B.

CATOCALA FRAXINI IN SUFFOLK.—My friend Mr. Jos. F. Green informs me that he captured, at sugar, a finely coloured *C. fraxini*, on Aug. 24th last, at Wrentham, Suffolk.—F. W. FROHAWK.

AUTUMNAL EMERGENCE OF LOPHOPTERYX CUCULLIA AND ACRONYCTA MENYANTHIDIS.—In the spring of this year I received about forty eggs of *L. cucullia* from West Sussex, which hatched in due course, and the larvæ fed up on maple with a very small percentage of losses, and the first commenced to prepare for pupation on July 5th, the remainder following suit within the next week or so. Ten perfect moths emerged between the 24th and 31st July. Assuming that the first to pupate was the first to emerge, the pupal stage occupied just nineteen days.

A. menyanthidis larvæ were full-fed on July 24th, and a somewhat undersized but otherwise perfect imago came forth on Nov. 3rd. In both cases the larvæ and pupæ were kept out of doors, but to some extent protected from the weather, both as regards the sun's rays and rain.—ROBT. ADKIN; Lewisham, November, 1901.

LYCÆNA ÆGON AND L. ASTRARCHE (MEDON) IN CORNWALL.—On June 14th I took a large number of *L. ægon* on the north coast of Cornwall. I worked a district for about an hour and a half, and took only three specimens, but eventually happened on a sheltered valley where they positively swarmed. I stayed until sundown, and it was a glorious sight to see them asleep on the grass-stems, and from which I took a few beautiful females, which appeared to be rather scarce on the wing. On examining my captures at home I found one undoubted specimen of *L. medon*, in grand condition. Both upper and under sides are quite distinct from *L. ægon*. The latter (*L. ægon*) has been found in considerable numbers in several districts within a couple of miles of the city.—W. A. ROLLASON; The White House, Truro, October, 1901.

ACHERONTIA ATROPOS IN DURHAM.—*A. atropos* has been unusually abundant in the larval state about here; several examples have been brought to me, and I have heard of others. The imago has also occurred. A larva was found on Sept. 14th, and an imago was taken on the same day; the latter was obtained on the fish-quay.—JOHN E. ROBSON; 15, Northgate, Hartlepool.

SPHINX CONVULVULI IN NORTHUMBERLAND.—Larvæ of *S. convulvuli* have been common this year. One Northumberland collector took over fifty, on a hedge grown over with *Convolvulus sepium*.—JOHN E. ROBSON; 15, Northgate, Hartlepool.

SPHINX CONVULVULI IN HAMPSHIRE.—Just a note to say that *S. convulvuli* has been very plentiful here this season; ninety-two have been taken up to the present, my contribution to that number being forty-two. Condition being so good makes one believe they have bred here this season.—W. G. HOOKER; Old Christ Church Road, Bournemouth, Sept. 26th, 1901.

MAMESTRA ABJECTA AND SPILODES PALEALIS AT ROMFORD.—It may be of interest to record the capture of *M. abjecta* in my garden, in August last. I always thought this was a coast insect, but we are about twenty miles from the Thames, and it could not have flown far, as it is a fresh specimen. *Spilodes palealis* is also taken here, which I also understood to be a coast insect.—(Rev.) W. CLAXTON; Navestock Vicarage, Romford, Essex.

XANTHIA GILVAGO AT BALHAM.—I took a rather worn specimen of this species at electric light in the town, on Oct. 2nd last.—E. C. GOULTON; 4, Cornford Grove, Balham, S.W.

NOTES ON SPILOSOMA (ARCTIA) FULIGINOSA.—In May I obtained forty-eight ova from a fine female *Arctia fuliginosa* which I found here. The eggs all hatched. I gave twelve larvæ to a friend; from the rest I have obtained thirty imagines, of which two are the var. *borealis*, besides other minor varieties, and I have one pupa and three larvæ hibernating.—G. E. J. CRALLAN; Bodorgan Manor, Bournemouth.

ODONATA AND LEPIDOPTERA AT WATFORD, HERTS.—During a stay at Watford in the first half of August, I observed the following dragonflies in the neighbourhood:—*Æschna grandis*, two; one in Cassiobury Park, and the other a few miles off. *Æ. cyanea*, one, near Watford. *Sympetrum striolatum* = *vulgata*, two, near Tring. I had never seen *Lycæna corydon* on the wing, and Mr. Arthur Cottam, of Watford, very kindly introduced me to thousands of the butterfly near Tring, on Aug. 8th. Another butterfly I had never seen before alive was *Hesperia comma*, flying commonly enough with *L. corydon*, *L. agestis*, and *L. alexis*. Other Lepidoptera on the same habitat were *Gonopteryx rhamni* (one, just out), *Eubolia bipunctaria*, and a specimen of *Zygæna filipendulæ*, which is an intergrade form midway between the type and the variety *cerinus* (Robson) with pale yellow spots and secondaries. It was as follows—Primaries: basal spots normal in colour; succeeding spots gradually paler until terminating with the marginal one pale yellow. Secondaries normal. Other butterflies I noticed in the Watford district were *Vanessa atalanta*, one. It seems as if it were not going to be an *atalanta* year, though I believe the species is not so common here as at Chester. *Thecla w-album*, several individual specimens near Watford, and one in the town itself, *L. argiolus* (getting over), *Epinephle ianira*, *Polyommatus phlæas*, *Ceanonympha pamphilus* (not so large or so bright in colour as our Delamere and North Wales specimens), and a few final examples of *E. tithonus*. I kept a sharp look-out for *Colias edusa* and *C. hyale*, but saw neither. Common “whites,” probably all or chiefly *Pieris rapæ*, were plentiful through the district. The weather all along was very warm and sunny until the 14th, when it broke up with copious showers.—J. ARKLE; Chester.

NOTES ON LEPIDOPTERA FOR SEPTEMBER, 1901.—The second brood of *Smerinthus populi* larvæ, which, as I previously mentioned (*ante*, p. 258), emerged from the ova on August 5th, have fed up very slowly, and at the time of writing, out of thirty that I kept (having given away the remainder), only seven have yet pupated. The first brood not only fed up much more quickly, but also seemed more brisk and lively: is the difference owing to the change in temperature? A brood of *Amphidasys betularia*, from ova laid by a black female, have successfully come through, but, curiously enough, one solitary larva, though apparently full-grown like the rest, went on eating for twenty-four days after the others had gone down to pupate, and it was only on Sept. 21st that he disappeared. On Sept. 4th I took a specimen of *Epinephle ianira* with a large patch of white on the left upper wing. It is not in perfect condition unfortunately, but it is good enough to set. It is a male, and the white patch is about the size of that on the right upper wing of the variety figured in Newman's ‘British Butterflies.’ The other three wings are, however, perfectly normal.—F. A. OLDAKER; Parsonage House, Dorking, Sept. 23rd, 1901.

LEPIDOPTERA AT FARNBOROUGH, KENT, AND NEIGHBOURHOOD.—Compared with last year, this season's collecting is almost nil. All through the summer “sugar” seems to have had no attraction whatever. Some evenings, in fact, with every appearance of being most favourable, have produced nothing. Last night (Sept. 23rd) I sugared about fifty trees, &c., and examined them all five or six times, the net

result being two earwigs and one "daddy longlegs"; last year at the same time and on the same trees the following were positively swarming:—*Amphipyra pyramidea*, *Anchocelis pistacina*, *A. lunosa*, *A. litura*, *Xanthia citrigo*, *X. fulvago* and var. *flavescens*, *X. flarago* (*silago*), *Calymnia trapezina*, &c., with occasionally *Catocala nupta* and *Xanthia gilvago*. *Chariclea umbra* (*marginata*) came to "sugar" several times, also *Neuria reticulata*. I have "sugared" almost every night through the season, on all the "old" grounds, and the result is naturally disappointing. On the other hand, netting at dusk in the spring and early summer has produced fairly good results. *Asthena candidata* could be taken eight or ten with one sweep of the net at Derrick woods, *Macaria notata*, *Iodis lacteria*, *Tephrosia punctularia*, *Uropteryx sambucaria*, *Thyatira batis*, *T. derasa*, *Dicranura furcula*, *Drepana falcataria*, *Cymatophora fluctuosa*, *C. duplaris*, genus *Zonosoma*, *Hecatera serena* (on fences), *Pterostoma palpina*, *Hylophila prasinana*, *H. bicolorana* (*quercana*), *Numeria pulveraria*, *Bupalus piniaria*, *Geometra vernaria*, *G. papilionaria*, and many others have occurred more or less in profusion. *Notodonta dodonea*, *N. chaonia*, and *Plusia moneta* I also had the luck to take several times; but, taking the season altogether, it has certainly not been a good one here.—ALFRED J. LAWRENCE; Bromley Common, Kent, Sept. 24th, 1901.

LEPIDOPTERA RHOPALOCERA OF PARIS.—The following is a list of the butterflies observed by me in the suburbs and environs of Paris during the months of June, July, and September, 1901:—JUNE and JULY.—*Papilio machaon*, two captured; one, in the neighbourhood of the canal, Forest of Fontainebleau, the other at Courbevoie; others (or the same one on different occasions) seen flying over lucerne field at Courbevoie. *P. podalirius*, one seen, Forest of Fontainebleau. *Aporia crataegi*, common, especially in Forest of Fontainebleau; fairly common at Courbevoie and in Forest of St. Germain: by the end of June this species apparently disappears altogether. *Pieris brassicae*, fairly common. *P. rapae*, most abundant; perfect showers of them fluttering over the lucerne field at Courbevoie. *P. napi*, a few seen. *Synchlora daplidice*, fairly common, Courbevoie. *Leucophasia sinapis*, two captured in Forest of St. Cloud. *Gonopteryx rhamni*, one female captured in lucerne field, Courbevoie. *Cobias edusa*, a few seen; male captured at Courbevoie, female at Parc Maison Lafitte. *C. hyale*, two or three seen; both male and female noticed at Courbevoie. *Argynnis paphia*, captured at Chantilly; male and female also captured in Forest of St. Germain. *A. aglaia*, *A. adippe*, and *A. niobe* (one), captured at Chantilly. *A. euphrosyne* (one), captured in Forest of Fontainebleau. *Melitæa selene* (one), *M. cinxia* (one), and *M. athalia* (one), captured in Forest of Fontainebleau; several of the last-named at Parc Maison Lafitte. *Chrysophanus phlaeas*, fairly common, Courbevoie and Parc Maison Lafitte. *C. xanthe*, one specimen, Parc Maison Lafitte. *Thecla w-album*, on privet blossom in Forest of St. Germain, common on wild thyme in Parc Maison Lafitte; the specimens rather worn in this last locality. *T. quercus*, four or five seen; two captured, Parc Maison Lafitte, where there are plenty of young oaks. *Polyommatus alexis*, common. *P. argiolus*, not rare, Forest of Fontainebleau and Forest of St. Germain. *Vanessa atalanta*, two or three seen, Boulevard Bineau, Neuilly, and Forest of St. Germain. *V. io*, two captured, Courbevoie.

V. cardui, one captured, Courbevoie. *V. urticae*, fairly common, Courbevoie, Parc Maison Lafitte, Forest of St. Germain. *V. c-album*, one or two seen; one in Rue des Dames Augustins, Neuilly. *Satyrus ianira*, common. *S. tithonus*, common (in July). *S. moera*, a few seen in Forest of Fontainebleau; I did not succeed in taking any. *S. hyperanthus*, fairly common on one or two occasions, Forest of St. Germain, Parc Maison Lafitte. *Melanarge galatea*, very common, Courbevoie, Parc Maison Lafitte, Forest of St. Germain. *Cænonympha arcanius*, common in Forest of Fontainebleau; also noticed, but more sparingly, in Parc Maison Lafitte and at Courbevoie, and in Forest of St. Germain. *C. pamphilius*, common and generally distributed, not so common at first; it would seem, as *C. arcanius*, more abundant in July. *Syrichthus alreolus*, two captured, Forest of Fontainebleau. *Pamphila sylvanus*, fairly common, Forest of Fontainebleau, Chantilly, Parc Maison Lafitte. *P. linea*, fairly common, Forest of Fontainebleau, Parc Maison Lafitte, Courbevoie, &c. SEPTEMBER.—*Colias edusa*, fairly common, Courbevoie. *C. hyale*, fairly common, Courbevoie (rather commoner than *C. edusa*). *Synchlœ daphidice*, fairly common, Courbevoie. *Pieris brassicae* and *P. rapae*, abundant, Courbevoie. *Vanessa io*, fairly common, Courbevoie. *V. c-album*, two captured, Boulevard Bineau, Neuilly. *V. urticae*, a few seen, Courbevoie. *V. atalanta*, one or two, Boulevard Bineau. *V. cardui*, two captured, Courbevoie. *Satyrus aegeria*, one seen, Versailles. *Argynnis latonia*, one seen, Courbevoie.—(Rev.) F. A. WALKER; Dun Mallard, Cricklewood.

NOTES ON THE LEPIDOPTERA OBSERVED AT CHICHESTER AND NEIGHBOURHOOD IN 1901.—I might begin by saying that never in my remembrance has there been a worse season for Lepidoptera than the past. The first insect which emerged in my breeding-cage was a specimen of *Cucullia verbasci* on April 28th. On May 1st *Lycæna argiolus* was seen flying in the garden, and was fairly abundant during the month. On the 20th *Bupalus piniaria* was taken by my friend Mrs. Fogden at Goodwood, near here. In the autumn of last year I took from a gas-lamp a female of *Ennomos autumnaria*, which deposited a large number of ova. These first hatched on May 28th. The larvæ were fed almost exclusively on oak. A little poplar was also given now and then. They were full-fed about the middle of July, the first pupating on the 20th of that month. From some unexplained reason the larvæ when quite full-fed began to die off. They remained in a rigid posture for days together, and died in this position, clasping the stems of the oak or poplar. Up to this time they appeared perfectly healthy. The first imago, a male, appeared on August 11th, and I subsequently obtained a good series of this once coveted and very beautiful "thorn." Early in June *Chelonia villica* were found, and a *Smerinthus tilia* emerged; a few days later *S. ocellatus*. On the 19th Mrs. Fogden took at sugar *Neuronia popularis* and *Miana strigilis*. I first met with *Anticlea rubidata* on July 3rd, which was almost the only geometer I obtained worth mentioning. On July 12th I saw a *Vanessa polychloros* flying in the garden; the first time I believe that I have seen it since 1878. On the 12th I took *Iodis vernaria*, beaten from clematis; on the 22nd *Acia alia emarginata*. On August 7th my first larva of *Acherontia atropos* was found on potatoes. In this month four *Colias hyale* were taken by my brother, Mr. Frederick Anderson, at clover.

During September a few more larvæ of *A. atropos* were met with, and on the 5th a pupa was sent me by Mrs. Fogden. On the 9th I took from a gas-lamp *Ennomos fuscantaria*, another on 13th, and a worn specimen on Oct. 1st. Sugar was a complete failure, the only insect worth naming attracted by it being *Catocala nupta*.—JOSEPH ANDERSON.

NOTES ON LEPIDOPTERA FROM PORTLAND.—Both broods of *Lycæna argiolus* were out in fair numbers, but of *L. adonis*, *Colias edusa*, and *Vanessa cardui*, so plentiful here last season, I have only seen one of the last named. *Acidalia degenaria* I managed to find in two or three spots on the island and took a few, but they were mostly in poor condition. I was fortunate enough to discover a larva of *Cucullia absinthii* on the 31st August feeding on wormwood growing in my garden, and, from the knowledge of its appearance thus gained, was enabled to find between twenty and thirty others at home and afield, but they did not pupate satisfactorily. In the spring-time I took a hundred or so of *Epunda lichenea* larvæ, which fed well and appeared to go down all right; but when I looked for the pupæ, I found the bulk had entirely disappeared, from what cause I cannot say. *Helio-phobus hispidus* I found in its usual haunts in fair numbers. A few *Acrophyla australis* came to sugar, and in May I found about a dozen larvæ, from which I bred five imagines. More common insects have not been generally plentiful here this season. I had no difficulty in obtaining ova of *H. hispidus* and of *E. lichenea*, the former of which have just hatched.—JNO. T. HYDE; The Grove, Portland.

LEPIDOPTERA AT LIGHT IN HERTFORDSHIRE.—In continuation of my notes on Lepidoptera taken at light in this county during 1899 (*vide* Entom. xxxiii. pp. 92 and 93), I now give below a list of those I obtained from January 1900 to the end of September, 1901. During that period I captured rather more than two hundred and thirty different species within a short distance of our house. The majority were captured with a light-trap fitted to a first-floor window, and the remainder at an electric lamp in a garden close by. I do not have my trap fitted with any killing apparatus, so that any specimens not required can be liberated in the morning.

The best captures were as follows:—*Sarothrips recayana* (*undulatus*), one. *Spilosoma menthastri*, a brown aberration. *Trichiura cratægi*, three males. *Luperina cespitis*, seven. *Apamea unanimitis*, one, *A. ophiogramma*, three. *Agrotis cinerea*, one male. *A. porphyrea* (*strigula*), one. *Orthosia suspecta*, one. *Calymnia pyralina*, fairly common. *Asteroscopus sphinx*, males fairly plentiful. *Plusia moneta*, four (also four more taken at dusk). *Spilodes palealis*, one. *Galleria mellonella*, one.

The following is a list of the other species. The dates after the commoner species indicate the earliest and latest dates on which they were observed on the wing during the period dealt with.

Sphinges:—Remarkably scarce, being represented by single specimens of *Sphinx ligustri* (an exceptionally large one), and *Smerinthus ocellatus*.

Bombyces:—*Hylophila bicolorana* (*quercana*), one. *Nola cucullatella*, June 30th—July 13th. *Lithosia griseola*, one. *L. lurideola*, July 7th—July 30th. *Euchelia jacobææ*, one. *Arctia caia*, few. *Spilosoma lubricipeda*, May 28th—July 3rd. *S. menthastri*, May 19th—July 13th.

Porthesia similis, July 15th—Aug. 24th. *Dasychira pudibunda*, one male. *Pæcilocampa populi*, few. *Bombyx neustria*, July 20th—Aug. 16th. *Odonestis potatoria*, two males. *Lasiocampa quercifolia*, one, July 26th, 1900, which seems late. *Drepana falcataria* (*falcula*), one. *D. binaria*, one. *Cilix spinula*, May 19th—Aug. 20th. *Pterostoma palpina*, June 5th—Aug. 12th. *Lophopteryx camelina*, June 14th—Aug. 19th. *Phalera bucephala*, June 3rd—July 13th. *Pygæra curtula*, one. *Thyatira derasa*, three.

Noctuæ:—*Bryophila perla*, July 14th—Aug. 16th. *Diloba cæruleocephala*, fairly common. *Leucania conigera*, July 5th—July 28th. *L. lithargyria*, June 20th—July 28th. *L. comma*, June 5th—July 24th. *L. impura*, July 6th—July 31st. *L. pallens*, June 18th—July 15th. *Gortyna ochracea*, one. *Hydræcia nictitans*, July 24th—Aug. 23rd. *H. micacea*, July 27th—Sept. 22nd. *Axylia putris*, one. *Xylophasia lithoxylea*, four. *X. monoglypha*, June 22nd—July 31st. *Dipterygia scabriuscula* (*pinastri*), May 29th—July 13th. *Neuronia popularis*, males common, two females. *Cerigo matura*, three. *Luperina testacea*, Aug. 1st—Sept. 10th. *Mamestra brassicæ*, May 29th—Sept. 9th. *M. persicariæ*, June 30th—July 28th. *Apamea basilinea*, five. *A. oculea*, July 4th—Aug. 18th. *Miana strigilis*, June 9th—Aug. 16th. *M. fasciuncula*, one. *M. bicoloria* (*furuncula*), one. *M. arcuosa*, two. *Grammesia trigrammica* (*trilinea*), May 26th—June 27th. *Caradrina morpheus*, June 4th—July 27th. *C. alsines*, June 21st—Aug. 4th. *Rusina tenebrosa*, males common, two females; June 9th—July 6th. *Agrotis puta*, males common, two females, May 19th—Sept. 5th. *A. suffusa*, one. *A. segetum*, June 6th—June 25th. *A. exclamationis*, May 29th—July 6th. *Noctua augur*, June 20th—July 13th. *N. plecta*, six. *N. c-nigrum*, four. *N. triangulum*, three. *N. festiva*, June 14th—July 4th. *N. rubi*, three. *N. baja*, two. *N. xanthographa*, Aug. 10th—Sept. 14th. *Triphæna janthina*, July 25th—Aug. 22nd. *T. comes* (*orbona*), Aug. 6th—Sept. 11th. *T. pronuba*, June 7th—Sept. 6th. *Amphipyra tragopogonis*, Aug. 13th—Aug. 19th. *Mania typica*, three. *M. maura*, one. *Pachnobia rubricosa*, two males. *Tæniocampa gothica*, April 15th—May 25th. *T. incerta* (*instabilis*), one. *T. stabilis*, April 30th—May 11th. *T. gracilis*, one. *Orthosia lota*, Oct. 11th—Oct. 20th. *Anchocelis pistacina*, Sept. 14th—Oct. 13th. *A. lunosa*, abundant; first seen Sept. 3rd. *Cerastis racinii*, Oct. 16th—Nov. 1st, 1900; and in January and March, 1901. *Scopelosoma satellitia*, Oct. 25th—Nov. 3rd. *Xanthia citrigo*, two. *X. fulvago* (*cerago*), Sept. 6th—Sept. 24th. *X. flavago* (*silago*), Sept. 11th—Sept. 24th. *X. gilvago*, two. *X. ferruginea* (*circellaris*), fairly common. *Calymnia trapezina*, fairly common. *C. diffinis*, two. *C. affinis*, one. *Dianthæcia capsicola*, one. *Hecatera serena*, two. *Miselia oxyacanthæ*, common. *Euplexia lucipara*, two. *Phlogophora meticulosa*, first seen July 3rd. *Hadena adusta*, one. *H. dentina*, June 1st—June 29th. *H. trifolii* (*chenopodii*), two. *H. oleracea*, June 9th—Aug. 9th. *H. thalassina*, one. *H. genistæ*, three. *Xylocampa lithoriza*, April 15th—May 23rd. *Habrostola tripartita* (*urticæ*), three. *H. triplasia*, two. *Plusia chrysis*, June 21st—July 4th. *P. pulchrina*, one. *P. gamma*, July 25th—Oct. 30th. *Catocala nupta*, one.

Geometræ:—*Uropteryx sambucaria*, July 1st—July 23rd. *Epione apiciaria*, two. *Rumia cratægata* (*luteolata*), June 4th—Sept. 1st.

Metrocampa margaritaria, one. *Pericallia syringaria*, three. *Selenia illunaria* (*bilunaria*), four. Ditto, var. *juliaria*, July 22nd—Aug. 11th. *S. lunaria*, four. *Odontopera bidentata*, May 26th—June 15th. *Crocallis elinguaris*, July 24th—Aug. 24th. *Ennomos tiliaria* (*canaria*) July 26th—Sept. 16th. *E. erosaria*, one. *Himera pennaria*, Oct. 19th—Nov. 4th. *Amphidasys betularia*, one male. *Hemerophila abruptaria*, May 5th—May 24th. *Boarmia repandata*, one. *B. rhomboidaria* (*gemmaria*), males, July 3rd—Aug. 3rd, one female. *Geometra papilionaria*, two. *Phorodesma bajularia* (*pustulata*), one. *Iodis lactearia*, three. *Hemithea thymiaris* (*strigata*), ten, July 4th—July 19th. *Acidalia dimidiata* (*scutulata*), two. *A. bisetata*, July 6th—July 25th. *A. virgularia* (*incanaria*), several. *A. imitaria*, two. *A. aversata*, June 22nd—Aug. 15th. *Timandra amataria*, one. *Cabera pusaria*, June 5th—July 25th, including one female. *Bapta taminata* (*bimaculata*), one. *Halia warraria* (*rauaria*), July 6th—July 23rd. *Panagra petraria*, few. *Abraças grossulariata*, July 6th—July 23rd. *A. ulmata* (*sylcata*), one. *Lomaspilis marginata*, two. *Hybernia rupicapraris*, males, Jan. 22nd—Feb. 23rd. *H. leucophæaria*, one male. *H. aurantiaria*, males, Nov. 3rd—Nov. 29th. *H. marginaria* (*progemmaria*), males, Feb. 24th—March 12th. *H. defoliaria*, males, Nov. 22nd—Dec. 1st. *Cheimatobia brumata*, males, Nov. 21st—Nov. 29th. *C. boreata*, one. *Oporabia dilutata*, Oct. 17th—Oct. 27th. *Larentia didymata*, four. *Eupithecia pulchellata*, three. *E. centaureata* (*oblongata*), June 15th—Aug. 24th. *E. subfulvata*, four. *E. nanata*, one. *E. subnotata*, July 11th—July 26th. *E. minutata*, one. *E. rectangulata*, June 5th—July 23rd. *Thera variata*, fairly common. *Hypsipetes elutata* (*sordidata*), July 17th—Aug. 17th. *Melanthia ocellata*, May 28th—Aug. 24th. *Melanippe subtristata* (*sociata*), May 26th—Aug. 17th. *M. montanata*, one. *M. fluctuata*, May 11th—Sept. 10th. *Anticlea badiata*, five. *A. nigrofasciaria* (*derivata*), four. *Coremia designata* (*propugnata*), eight. *C. ferrugata*, three. *C. unidentaria*, six. *Cidaria truncata*, several. *C. testata*, one. *C. fulvata*, July 13th—July 23rd. *C. pyraliata*, (*dotata*), two. *C. associata*, June 14th—July 23rd. *Pelurga comitata*, July 19th—Aug. 18th. *Eubolia cervinata*, two. *E. plumbaria*, two. *Anaitis plagiata*, one. *Chesias spartiata*, one.

Deltoides:—*Hypena proboscidalis*, three. *Herminia tarsipennalis*, June 24th—July 15th. *H. grisealis* (*nemoralis*), three.

Pyalides:—*Pyralis costalis* (*fimbrialis*), June 30th—Aug. 23rd. *P. farinalis*, two. *P. glaucinalis*, July 14th—Aug. 9th. *Scoparia cembræ* var. *zelleri*, one. *Pyrausta purpuralis*, two. *Endotricha flammealis*, July 13th—Aug. 24th. *Hydrocampa nymphaea*, three. *H. stagnata*, one. *Botys hyalinialis*, two. *B. ruralis*, July 19th—Aug. 24th. *B. urticata*, two. *Ebulea sambucalis*, June 5th—July 25th. *Pionea forficalis*, May 19th—June 21st, and July 25th—Aug. 24th. *Scopula olivalis*, one. *S. prunalis*, July 3rd—Aug. 6th. *S. lutealis*, one.

Crambi:—*Crambus pratellus*, one. *C. pascuellus*, two. *C. perlellus*, one. *C. tristellus*, Aug. 6th—Aug. 24th. *C. geniculens*, few. *C. hortuellus*, six.

Phycitidæ:—*Hypochalcia ahenella*, one. *Aphomia sociella*, three males.

Pterophori:—*Alucita hexadactyla* (*polydactyla*), May 11th—June 5th. *Aciptilia pentadactyla*, two.

Tortrices :—*Tortrix podana*, June 28th—July 25th. *T. heparana*, one. *T. ribeana*, three. *T. forsterana*, three. *Teras contaminana*, one. *Penthina ochroleucana*, June 21st—July 14th. *P. betulatana*, one. *Spilonota rosacolana*, three. *S. roborana*, fairly common. *Pardia tri-punctana*, one. *Aspis ulmanniana*, six, June 30th—July 16th. *Scia-phila subjectana*, few. *Xanthosetia zægana*, three. *X. hamana*, two.—
 PHILIP J. BARRAUD; Bushey Heath, Herts.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—October 16th, 1901.—Mr. E. Saunders, Vice-President, in the chair.—M. J. H. Fabre, of Sérignan, Vaucluse, France, was elected an Honorary Fellow of the Society.—Mr. W. Schaus, F.Z.S., of Trentham House, Twickenham, was elected a Fellow of the Society.—Mr. C. Morley exhibited, for the Rev. E. N. Bloomfield, leaves of hornbeam from Battle, and a photograph of leaves of sweet chestnut from Haslemere, rolled by *Attelabus curculio-noides*. The former were not rolled by reason of a scarcity of their usual oak, which abounds in the locality.—Mr. R. Adkin exhibited a specimen of *Pieris daplidice* taken by him at Eastbourne on August 19th last. He said that the insect was flying strongly, and in that respect and indeed in general appearance resembled on the wing a pale female of *Colias hyale*. Mr. Rowland-Brown asked if there were any records of recent date of the discovery of the larva in this country, and with Mr. A. H. Jones corroborated the swift habit of flight in the species. In the discussion upon immigrant species that followed, Mr. R. McLachlan said that the recent observations of *Papilio machaon* in various parts of the country seemed to suggest immigration on the part of a species not usually regarded as migratory. He also said that he knew of no reliable evidence of the larva of *Pieris daplidice* having occurred on this side of the Channel.—Mr. C. P. Pickett exhibited a series of *Melitea cinxia* bred in June last from larvæ taken in the Isle of Wight, including light and dark varieties of the females, one male with extra light upper wings, and one male with the lower wings almost black. He also exhibited a series of *Chærocampa elpenor*, bred in June last from larvæ taken at Broxbourne in July, 1900, including a variety of the male with purplish lower wings, and another with purple markings on the upper wings.—The Rev. F. D. Morice exhibited specimens of *Hedychrum rutilans*, Dhl., and *Salix propinquus*, Lep., taken at Lyndhurst by Miss Ethel Chawner, and both new to the British list. He also exhibited two monstrosities, viz.—*Allantus arcuatus*, male (sawfly), having on the left side two perfect and two other rudimentary wings, and *Gorytes quinquecinctus* (fossor), with the abdominal segments extraordinarily twisted out of their proper shape and places.—Mr. E. Saunders said that these specimens appeared to him identical with Continental *propinquus*, which was not rare in the south of Europe, where it was sometimes black, and sometimes red towards the middle of the abdomen, but that he thought it could not be a variety of any British species, as we have no species with a rugose propodeum which could agree with it.—Mr. Arthur M. Lea communi-

cated "A List of the Australian and Tasmanian Mordellidæ, with Descriptions of New Species"; and Mr. Edward Meyrick, B.A., F.Z.S., "Descriptions of New Lepidoptera from New Zealand."—Mr. E. Saunders then read a paper upon "Hymenoptera Aculeata collected in Algeria by the Rev. A. E. Eaton, M.A., and the Rev. F. D. Morice, M.A.; Pt. I.—Heterogynæ and Fossores to the end of Pompilidæ."—H. ROWLAND-BROWN, *Hon. Sec.*

SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—September 18th, 1901.—Mr. W. J. Lucas, B.A., F.E.S., Vice-President, in the chair.—Mr. F. M. B. Carr exhibited a varied series of *Cidaria truncata* from Porlock, North Somerset, taken among bilberry. No specimens of the yellow form were seen.—Mr. Lucas, two specimens of the rare dragonfly, *Libellula fulva*, taken near Christchurch by Major Robertson.—Mr. Bishop, a bred series of *Eugonia polychloros*, from ova seen deposited naturally in the open by a female in the New Forest.—Mr. R. Adkin, a specimen of *Cossus ligniperda*, bred from a larva captured and then placed in a tree in his garden; and a series of *Boarmia consortaria* reared from Abbots Wood pupæ, remarking on the scarcity of the species for some time till the last two years.—Mr. Kemp, two specimens of *Sphinx convolvuli* taken at Hythe, near Southampton.—Mr. Colthrup, a nice series of *Colias hyale* from Margate; *Triphæna orbona*, from Deal, showing red forms of various intensity; and a very variable series of *Triphæna fimbria* from the Isle of Wight.—Messrs. Harrison and Main stated that they had taken some ten specimens of *S. convolvuli* at lamps at Forest Gate. Mr. McArthur said that the species was common at Brighton.

October 10th.—Mr. F. Noad Clark, Vice-President, in the chair.—Mr. McArthur exhibited larvæ of *Triphæna comes* in a novel cage adapted from one of the globular wire cages for catching flies.—Mr. Barnett, a variety of *Epinephele tithonus* with xanthic spots, and an unusually large and pale male of *Fidonia atomaria*, both from Oxshott.—Mr. Garrett, a long series of *Vanessa io*.—Mr. Kirkaldy, his collection of Nabinæ from all parts of the world, and called attention to its being especially rich in winged forms.—Mr. Kemp, a portion of broom-stem bored by the Coleoptera—*Hylastinus obscurus*, *Læmophlæas ater*, and *Phlæophthorus rhododactylus*, from Oxshott.—Mr. Adkin, a fine bred series of *Lophopteryx cuculla* (*cucullina*) from Sussex, and remarked that some of the pupæ were lying over.—Mr. Step communicated a short Report of the Field Meeting held at Oxshott on Oct. 5th, and gave a list of the fungi gathered.—Mr. South exhibited specimens of *Thyatira batis*, *T. cognata*, and *T. aurorina*, belonging to the Cymatophoridæ, together with *Risoba trimaculata* and *Cymatophoropsis sinuata*, belonging to the Stictopterina; and contributed notes, especially with reference to the strong superficial resemblance between these two sets of species, although they belonged to two widely-separated groups of moths.—HY. J. TURNER, *Hon. Report Sec.*

BIRMINGHAM ENTOMOLOGICAL SOCIETY.—September 16th, 1901.—Mr. G. T. Bethune-Baker, President, in the chair.—Mr. John Levick, Jun., Livingstone Road, Handsworth, was elected a member.—Mr. G. H. Kenrick mentioned the occurrence of *Acronycta alni* at light at Edg-

baston; also of *Liparis salicis* at Edgbaston.—Mr. R. C. Bradley exhibited a small collection of insects made on the Lickey Hills on June 25th, including *Hecatera serena*, *Tinea semifulvella*, *Dioctria atricapella*, &c.—Mr. J. T. Fountain, a number of *Leucoma salicis* taken at Bournville, Lifford, &c., some having been found in Bournville station; he found them quite common in that district, obtaining many larvæ and pupæ from poplars.—Mr. G. H. Kenrick, two collections of Lepidoptera, one made near Bolt Head, Devon, during the first week in July, and the other from Tongue, in Sutherlandshire, during the middle of August. Amongst the former lot were *Sesia philanthiformis*, which was very common on the cliffs, *Heliothis peltigera*, *Agrotis lunigera*, *A. lucerneæ*, *A. corticea*, *Bryophila glandifera*, *Hecatera serena*, *Anticlea rubidata*, &c.; amongst the latter were *Epunda lutulenta* = ? var. *luneburgensis*, *Agrotis cursoria* (dark brownish forms), *A. tritici*, *Noctua festiva* var. *conflua*, *Polia chi* (with dark hind wings), *Xanthia cerago* (lemon-coloured), *Stilbia anomala*, *Larentia cæsiata* (well marked), *L. flavicincta*, *Cidaria immanata* (fine forms, one with black bar), *Carsia imbutata*, *Larentia olivata*, &c. The larvæ of *Demas coryli*, he said, swarmed everywhere at Tongue.—Mr. G. W. Wynn, the following Lepidoptera, all bred from larvæ found in Wyre Forest last September: *Demas coryli*, *Drepana falcataria*, *Pygæra curtula*, *Orgyia pudibunda*, *Amphidasys betularia* var. *doubledayaria*, *Hadena contigua*, *Cerura bifida*, and *Ephyra pendularia*; also a few Diptera from Derbyshire—*Asilus crabroniformis*, *Tachina grossa*, *Chrysochlamys cuprea*, &c.—Mr. A. D. Timms, cocoons of *Attacus atlas* sent to the University Museum.—Mr. Colbran J. Wainwright, a few Diptera from Hay Woods, Warwickshire, taken July 28th: *Didea alneti*, *Chrysochlamys cuprea*, *Eumerus ornatus*, *Chilosia æstracea*; the last three had not previously been taken anywhere near Birmingham.—Mr. G. T. Bethune-Baker, a long series of *Lycæna arion* from many places, including a series taken by himself in Cornwall this year; some old Cotswold ones and various European specimens, including var. *obscura* from the High Alps. He pointed out a most decided difference in the colour between the Cornish and Gloucestershire specimens, the former showing a brighter, paler, more metallic blue; also he called attention to a gynandromorphous specimen amongst the Cornish ones.—Mr. W. Harrison, the following Lepidoptera:—*Leucophasia sinapis* and *Nemeobius lucina* from Witherslack, where they were common; *Cenonympha davus* from Westmoreland, which he pointed out were darker than Scotch forms he had, and not so red as Welsh ones; *Smerinthus ocellatus* from Harborne, where the larvæ were common in 1900, but none were seen in 1901; *Melanargia galatea*, which was very abundant in the Cotswolds, Gloucestershire, wherever he went this year; *Hesperia comma*, common on one hill only in the Cotswolds; *Vanessa c-album* from Trench Woods and the Cotswolds, at both of which places it was common this year; and *Acidalia ornata* from Rodborough Hill, Glos.

October 21st.—The President in the chair.—Mr. R. Bradley exhibited *Anthrax paniscus*, males and females, taken last August at Crickieth, North Wales, in dull weather.—Mr. G. W. Wynne, a collection of Lepidoptera made at Wyre Forest, at sugar, on two evenings only, June 23rd and 24th last. He was unusually successful, the moths being in great numbers at every patch of sugar. They in-

cluded *Thyatira batis*, *T. derasa*, *Cymatophora duplaris*, *C. fluctuosa* (one), *C. or.*, and *C. ocularis* (one), *Acronycta leporina*, *Xylophasia hepatica*, *Mamestra sordida*, *Agrotis exclamationis* (fine vars.), *A. cinerea*, *Aplecta herbida*, *A. tincta*, *Hadena contigua*, *Tephrosia luridata* (*extersaria*). Of these, *C. duplaris*, *T. extersaria*, *H. contigua*, and *A. tincta* were common, the last-named being a perfect nuisance; of *A. cinerea* he took one female, which in his experience was much rarer than the male, and he had never seen it at sugar before.—Mr. C. J. Wainwright, a specimen of *Protoparce convolvuli*, which had been sent to him from Wiltshire.—Mr. H. W. Ellis, the following Coleoptera:—*Silpha sinuata*, from Bewdley; *Galerucella tenella*, *Hydrochus elongatus*, and *Bagous cylindrus*, all from Bedfordshire, the latter species in some numbers.—Mr. J. T. Fountain, *Pieris daphidice* from Jersey in August last; bred series of *Selenia lunaria*, both spring and summer broods, for comparison; and a series of *Ennomos angularia*, bred from a Brockenhurst female.—Mr. A. D. Innes, the thysanuran *Machilis maritima*, from Port Erin, Isle of Man; they were common on the rocks and cliff-faces, and also came in to light at the biological station, and were common all over the house. *Anurida maritima*, also from Port Erin, August, 1901, a species of *Collembola* from rock-pools, &c., below high-water mark.—Mr. G. T. Bethune-Baker, a drawerful of *Cænonympha* from many localities, including *C. davus* var. *rothliebi* from Witherslack and Chartley Moss, and pale Continental forms. He said that though Barrett figures and describes the pale form of this species as a mountain form, yet in his experience it was the usual form on the Continent.—Mr. W. H. Flint read a very interesting paper upon the digestive tract in Lepidoptera. He gave an account of his own researches, illustrating them upon the blackboard, describing the form, functions, and variations, &c., of the digestive organs. Among other things, he mentioned that this spring he had a large brood of *Endromis versicolor*, which died without eating; upon dissection he found that the mesenteron and gnostodeum had never joined up, consequently there was no passage through.—COLBRAN J. WAINWRIGHT, *Hon. Sec.*

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY. — The first meeting of the Winter Session was held on October 14th, in the Royal Institution, Colquitt Street, with the Vice-President, Mr. R. Wilding, in the chair.—Dr. G. W. Chaster exhibited a collection of Southport Coleoptera, including at least forty species which have not yet been found in the Liverpool district. Amongst these may be mentioned, *Carabus glabratus* (probably introduced), *Hydrena nigrita*, *Phleopora corticalis* (both very rare), *Anisotoma picea* (hitherto only known from Scotland), *Antherophagus silaceus*, *Ammæcius brevis*, *Anthicus bimaculatus* (up to the time of capture of this species by Dr. Chaster and Mr. Tomlin, at Southport, only two specimens were known—see Dr. Ellis's Liverpool List), *Orthochetes setiger*, *Centhorrhynchidius dawsoni*, and *Rhynchonchus gramineus*. Mr. Wilding heartily congratulated Dr. Chaster on the addition of such rarities to the Lancashire fauna.—Mr. F. Birch, *Scarites gigas*, from West Africa; he also read a letter from Mr. E. J. B. Sopp, on the distribution of one of the rarer cockroaches, *Periplaneta australasiae*, specimens of which were exhibited.—Mr. Oulton Harrison, a living larva of *Lampyris noctiluca* from Delamere Forest.—Mr. Crabtree, a

portion of Mr. McArthur's collection of Lepidoptera from the Island of Lewis, including strange varieties of *Melanippe subtristata*,* *Boarmia repandata*, *Agrotis cursoria*, &c.; also a very curious diaphanous-winged specimen of the dark variety of *Odontopera bidentata*, bred with others from Manchester larvæ.—Mr. J. Collins exhibited and described a fine melanic form of *Macaria liturata*, from Delamere, for which he proposed the varietal name *nigrofulrata*: also a fine collection of species of the genera *Xanthia* and *Dianthæcia*.—Mr. C. F. Johnson exhibited very fine series of *Thecla w-album*, *Macaria notata*, *Nola confusalis*, *Agrotis ashworthii*, *A. cursoria*, &c.—Mr. F. C. Thompson, bred specimens of *Triphæna jimbria*, and said that according to his experience the larvæ were almost always found on bramble, and not on birch, as recorded in the books.—Dr. Cotton, a beautiful series of *E. octomaculata*.—Messrs. A. and H. Tonkin, captures in South Devon in May and June, including *Anticlea rubidula*, *Bapta taminata*, *Zonosoma omicronaria*, &c. Specimens of *Argynnis paphia* intermediate between the type and var. *valezina* from Beddgelert, *Venusia canbricaria*, and *Xylophasia scolopacina* from Barmouth, *Bryophila glandifera* and *Aspilates citraria* from the Welsh Land's End (St. David's Head), were shown by Mr. F. Birch.

November 11th.—Mr. R. Wilding, Vice-President, in the chair.—Messrs. Mallinson, Wynne, Dunlop and Harrison were elected members of the Society. The December meeting, which is to be held in Chester, was shortly discussed.—Mr. F. N. Pierce, F.E.S., read a paper entitled, "The Home of the Swallow-tails," which was illustrated by limelight views. After a short *résumé* of the notices of *Papilio machaon* scattered through the chief entomological literature of three centuries, he described its "habit, habits, and habitat." From his remarks upon the two latter we derived the cheering intelligence that in the Norfolk Broads, at all events, this splendid insect will not be exterminated for many a year to come. Its strong flight, for the most over swamps, the wide diffusion of its food-plant, *Daucus carota*, which carpets the ground everywhere, the consequent impossibility of its being all examined, and the possession by the larva of peculiar organs to drive away ichneumons and birds, all point to this conclusion. The habit of *P. machaon* is very constant, the essayist having seen but few remarkable varieties. One of these, in which the ground colour is deep yellow, he exhibited along with other fen species. During the discussion Dr. J. W. Ellis gave a short account of his fenland experiences. Mr. R. Wilding was confident that new species of all Orders awaited the enthusiastic worker in the fens.—Mr. E. J. Burgess-Sopp exhibited the very beautiful *Chrysomela cerealis*, along with many other rarities, and stated that he was elucidating the life-history of this gem from Snowdon's coronet, a work which he is the first to attempt, so far as is known. Dr. Ellis referred to the pleasure which the sight of this species, occurring suddenly in abundance on the mountain, had given to him.—Dr. J. Cotton exhibited Lepidoptera from Grange and the New Forest.—Mr. W. A. Tyerman, a beautiful series taken at Carrog, which included *Plusia interrogationis*, *Larentia cæsiata*, and *Noctua triangulum*.—Specimens of *Chlœnius nigricornis*, from the banks of the river Gowy were shown, and their habits remarked upon by the Joint Secretary.—FREDK. BIRCH.

[* *Melanippe sociata* var. *obscurata*. See fig., Entom. xxi. p. 27.—ED.]

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TO CONTRIBUTORS.—All notes, papers, books for review, &c., and notices of exchange should be sent to the Editor—RICHARD SOUTH, 96, Drakefield Road, Upper Tooting, S.W.

INSECT FAUNA OF WARWICKSHIRE.—I am preparing a list of the insects of this county, with the assistance of friends, and should be glad of any information and lists of captures from any entomologists who have collected in the county. Any contributions will be fully acknowledged.—COLBRAN J. WAINWRIGHT; 2, Handsworth Wood Road, Birmingham.

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MAY 1901

No. 156

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OF

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EDITED BY RICHARD SOUTHGATE

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Duplicates.—W-Album,* Trigrammica, Neustria, Comma, Flavago, Affinitata, Isogrammata. *Desiderata*.—Promissa, Sponsa, Russula, Galii, Bombyliformis (Narrow-bordered Bee Hawk-moth), and many others.—A. Pike; 16, Exeter Road, Sherwood Rise, Nottingham.

Duplicates.—Numerous. Send list. *Desiderata*.—Larvæ of C-Album, and other larvæ, ova and pupæ.—V. E. Shaw; 8, Moss Hall Grove, North Finchley, Middlesex.

Duplicates.—Larvæ: Potatoria. Pupæ: Stellatarum, Porcellus (a few Hirtaria, Pennaria. *Desiderata*.—Fertile ova and pupæ (especially P. Populi).—L. A. Spencer; 52, Burghley Road, Highgate Road, London, N.W.

Duplicates.—Cinxia, Graphia, Valezina, Aglaia, Adippe, Galatea, Sibylla, Adonis, Agestis, Corydon, Ægon, Actæon, Ambigua, Literosa, &c.; larvæ of Villica. *Desiderata*.—Northern species and local larvæ.—A. Ford; "Hillside," Sunnyhills Road, Pokesdown, near Bournemouth.

Duplicates.—Adippe, Aureola, Monacha, Sponsa, Promissa, Cytisaria, &c. larvæ of Limacodes and Oleracea. *Desiderata*.—Larvæ and pupæ.—A. M. Smallpiece; Field Lodge, Burley, Ringwood, Hants.

Duplicates.—Larvæ of Caia. *Desiderata*.—Ova and larvæ of many species.—(Rev.) C. F. Thornehill; Calverhall Vicarage, Whitchurch, Salop.

Duplicates.—Tiliaria,* Falcula,* Argiolus,* Punctaria,* Porata,* Aversata, Fagi,* Camelina,* Subsequa,* Fuscantaria,* Chamomillæ,* Smaragdaria,* Furcula, Vetulata,* Io,* Castrensis,* Rhamnata,* Unifasciata,* Rusticata, Ægon, Lineola, Irrorella, Aureola, Minos, &c., Biundularia* (N. Wales). *Desiderata*.—Ova, larvæ and pupæ: P. Populi, T. Cratægi, Dolabraria, Lunaria, Orbicularia, Imitaria, Pulveraria, Plumaria, Succenturiata, Scabiosata, Jassioneata, Fraxinata, Campanulata, Albipunctata, Dodoneata, A. Urticæ, Chaonia, Dodonea, Trepida, and many others.—Colonel Partridge; 72, St. John's Park, Blackheath.

Duplicates.—Trepidaria, Brunneata, Fumata, Obfuscata, Davus, Blandina, Chi, and Cæsiata. *Desiderata*.—Formicæformis, Muscæformis and other Sesidæ and offers.—E. A. Cockayne; 6, Tapton House Road, Sheffield.

Duplicates.—Corydon, Ægon (set and unset), Icarus, Galatea, Semele, Edusa, Napi, Io, Atalanta, V. Urticæ, two B. Rubi, Clathrata, Mensuraria, larvæ of Jacobææ, and one larva of Ligustri. *Desiderata*.—Pruni, Betulæ, Cinxia, Alsus, Athalia, C-Album, Artemis, Sibylla, Iris, Actæon, H. Comma, Atropos, Herp. Fuliginosa, Bombyliformis (narrow-bordered). All Sesidæ, Leporina, Pyralina, and Tiliæ.—C. A. Johnstone; Rosslyn, Marlborough (after September 8th: 14, Henleaze Road, Westbury-on-Trym, Bristol).

Duplicates.—Tryphæna, Subsequa. What offers?—F. H. Fisher; Cranborne Vicarage, Salisbury.

Duplicates.—M. Artemis, L. Salmacis, P. Geryon, N. Elymi, M. Expolita, T. Biundularia, G. Papilionaria, E. Venosata, Centaureata, and many others. *Desiderata*.—Very numerous.—John E. Robson; 15, Northgate, Hartlepool.

Duplicates.—Fine bred Moneta. *Desiderata*.—Sphegiformis, Asellus, Formicæformis, Arundinis, Muscerda, Conspicuata, Rubricata, Strigillata, Consignata, Irriguata, Lapidata, Ulvæ, Albivenosa, Sparganii, Auricoma, Strigosa, Abjecta, Caliginosa, Albipuncta, Exigua, Brevilinea, Pyrophila, Ravida, Subsequa, Ditrepegium, Ashworthii, Venustula, Peltigera, Armigera, Dipsacus, Cordigera, Lychnitis, Interrogationis, Abietaria, &c. Either kind of pin, if perfect and well-set. Accepts offers only answered.—M. Phipps; Woodside View, Victoria Road, Southborough Tunbridge Wells, Kent.

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Duplicates.—Pupæ of Templi and Myricæ; also imagos of Furva, Cursoria, Nigra, Fuliginosa* (var. Boralis), Furcula,* Carpini,* Versicolor,* Fascelina, Solidaginis. *Desiderata*.—Pupæ of many, and species Carmelita, Populi, Cucullis, Ridens, Dictæoides, and any of sharks (except Verbasci).—A. Gray; Moun Pleasant, 1a, Canal Street, Aberdeen, N.B.

Duplicates.—Castane, Tudorina, Promissa, Sponsa, Moneta (two), Polychloros, fine Hyale. *Desiderata*.—Numerous, especially Sesias, Convolvuli, Arion, &c.; black pins.—*H. W. Simmonds*; 66, *Sydney Street, Chelsea, S.W.*
Duplicates.—Cloantha Solidaginis, good specimens, full data, black or white s. *Desiderata*.—Living larvæ or pupæ.—*Charles Mosley*; 20, *Moor End Road, Lockwood, Huddersfield.*
Duplicates.—Edusa, Hyale, Aglaia, Adonis, Corydon, Tiliæ, Trifolii, Irrorella, mimula, Chrysorrhœa, Flavicornis, Myrtilli, Tritici, Puta, Parthenias, Adven-
 a, Hirtaria, Consonaria, Piniaria, Taminata, Citraria. *Desiderata*.—Numerous.
C. Levett; 107, *Brockley Road, London, S.E.*
Duplicates.—Well-set Caniola in good condition, not perfect; also few Ano-
 ra (males) in same condition. *Desiderata*.—Numerous. Black pins. Accepted
 answers.—*W. Crocker*; 7, *Westbourne Grove, Torquay.*
Duplicates.—Cinxia,* Davus, Cucullatella, Russula, Duplaris,* Potatoria,*
 plasia, Cruda, Instabilis, Capsincola,* Camelina,* Popularis, Fuscantaria,*
 agillaria, Derivata, Badiata, Impluviata, Suffumata, Corylata,* Betularia (black).
Desiderata.—Chamomillæ, Straminea, Albicillata, Firmata, &c. Accepted offers
 were within a week.—*J. Arkle*; 2, *George Street, Chester.*
Duplicates.—Ashworthii.* *Desiderata*.—Bractea. Liberal exchange for
 specimens, if good.—*J. Arkle*; 2, *George Street, Chester.*
Duplicates.—(Dragonflies) L. Dubia, Grandis, Juncea. *Desiderata*.—Gom-
 s vulgatissimus, and other local dragonflies.—*J. Arkle*; 2, *George Street,*
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Duplicates.—*Contiguaria*, *Inornata*, *Ambigua*, *Anachoreta* (St. Leonard's), *Radiata*, and other extreme forms of *Lubricipeda*; *Rubidata*, *Autumnaria* (Dover), *Fuscantaria* (dark Yorkshire), *Saucia*, *Neglecta*, *Illustraria*, *Betulella*, and many others. *Desiderata.*—*Apiformis*, *Asellus*, *Helveola*, *Rotundaria*, *Conspiciata*, *Constrictata*, *Oodoneata*, *Coronata*, *Stevensata*, *Auricoma*, *Caliginosa*, *Pyrophila*, *Semibrunnea*, *Flexula*, *Dentalis*, *Terrealis*, *Stachydalis*, *Costæstrigalis*, *Lineolalis*, *Resinalis*, *Alpinalis*, *Verbascalis*, *Straminalis*, *Lancealis*, *Myellus*, *Fascelinellus*, *Farrella*, *Mucronellus*, *Gigantellus*, *Caruella*, *Achatinella*, *Bistriga*, *Angustella*, *Abietella*, *Adelpheila*, *Genistella*, *Anella*, *Festaliella*, *Pilosella*, *Tetradactylis*, &c.—G. T. Porritt; *Crosland Hall, near Huddersfield.*

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Duplicates.—*Machaon*,* *Sinapis*, *Edusa* (few), *Rhamni*, *Paphia*, *Valesina*, *Anrinia*, *Sibylla*, *Astrarche*, *Argiolus*,* *Porcellus* (few), *Bombyliiformis* (narrow one). *Desiderata*.—*Semiargus*, *Palæmon*, *Apiformis*, *Crabroniformis*.—*P. E. Freke*; 7, *Limes Road, Folkestone, Kent*.

Duplicates.—*Anachoreta** (St. Leonard's-on-Sea), *Autumnaria** (Folkestone) *Desiderata*.—Numerous, especially *Noctuæ*; good specimens, black pins only (*Miss*) *A. D. Edwards*; *The Uit-Span, Onslow Gardens, Wallington*.

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Duplicates.—*Io*,* *Atalanta*,* *Paphia*, *Aglæa*, *Egeria*, *Cardamines*, *Argiolus*, *Thaumas*, *Phlæas*, *Corydon*, *Adonis*, *S. Ligustri*,* *Oceliatus*,* *S. Populi*,* *Antiqua*,* *Vinula*, *Pronuba*, *Filipendulæ*, *Monacha*,* *Nupta*,* and a few others. Mostly black pins. *Desiderata*.—*Athalia*, *C-Album*, *Betulæ*, *Palæmon*, &c. Black pins *F. A. Oldaker*; *Parsonage House, Dorking*.

Duplicates.—*Euphrosyne*, *Selene*, *Artemis*, *Io*,* *Atalanta*,* *Tages*, *Linea*, *Sylvanus*, *Filipendulæ*,* *Jacobææ*,* *Rumicis*, *Lithargyria*, *Graminis* (fair), *Trilinea*, *Glareosa*, *Brunnea*, *Gothica*, *Instabilis*, *Stabilis*, *Cruda*, *Rufina*, *Litura*, *Silago*, *Chinubosa*, *Typica*,* *Wavaria*, *Petraria*, *Progemmaria* (males), *Elutata*, *Badiata*, *Palumbaria*. *Desiderata*.—Very numerous, Black pins.—*G. Fleming*; 9, *Fairview Terrace, Merthyr Tydfil*.

Duplicates.—*T. Rubi*, *Lacertula*, *Dispar*, *Duplaris* (dark), *Fulva*, *Phragmitidis*, *Lutosa*, *Trigrammica*, *Tenebrosa*, *Suspecta*, *Graminis*, *Lubricipeda* var. *Radiata*. *Desiderata*.—*Apiformis*, *Bombyliiformis*, and many others.—*A. G. Wallington* 10, *Arthur Street, Warrington*.

Duplicates.—Fine bred specimens (this season); *Gortyna*, *Flavago* (Ochracea), also *Linosa*, *Diluta*, *Litura*, *Cerago*, *Silago*, *Illustraria* and var. *Delunaria*, *Illustraria* var. *Julyaria*, *Syringaria* (and ova), *Tiliaria*, *Crepuscularia*, *Betularia*, *Curtul* (both broods), *Munda*, *Ocellatus*, *S. Populi*, *S. Ligustri*, *D. Pinastri*, *Candidata*, *Taminata*, *Piniaria* (males), *Palpina*, &c. *Desiderata*.—Larvæ or pupæ of *Myrtilla*, *Batis*, *Derasa*, *Aceris*, *Orion*, *Aprilina*, *Ridens*, *Rectilinea*, &c.; ova of *Nupta*, *Sponsa*, and *Promissa*; and imagos (on black pins) of many other common species (especially *D. Oo*).—*A. J. Lawrence*; *Bromley Common, Kent*.

Duplicates.—*Glandifera** and var. *Suffusa*, *Fimbria* (2), *Sponsa* (2), *Promissa* (2), *Corydon*, *Perla*, *Polychloros*, *Polyommata*, *Villica* (4), *Orbona*. *Desiderata*.—Numerous.—*C. W. Colthrup*; 127, *Barry Road, East Dulwich, S.E.*

Duplicates.—*Paphia*, *Velleda*, *Filipendulæ*,* *Lubricipeda*,* *Ferrugata*, *Badiata*, *Comes*,* *Chi*, *Verbasci*, *Glaucæ*, *Typica*,* *Festiva*,* *Pisi*,* *Fulva*, *Capsincola*, *Perla*, *Haworthii*, *Pilosaria*, *Affiniata*, and *Impluviata* (dark). *Desiderata*.—Numerous.—*W. G. Clutton*; 10, *Hallwell Street, Burnley*.

Duplicates.—*Aglæa*, *Adippe*, *Euphrosyne*, *Io*,* *Semele*, *Argiolus*, *Thaumas*, *Lurideola*, *Potatoria*,* *Micacea*, *Trigrammica*, *Suffusa*, *Fimbria*, *Tragopogonis*, *Rufina*, *Pistacina*, *Litura*, *Gilvago*, *Oxyacanthæ*, *Proteus*, *Thalassina*, *Umbratica*, *Abraxas*, *Sylvata*, and many others. *Desiderata*.—Many common *Noctuæ* and *Geometræ*.—*A. S. Tetley*; *Newtown, North Wales*.

Duplicates.—Larvæ of *Hera* (S. Devon). *Desiderata*.—Ova of *Moneta* and many other species.—*F. C. Woodforde*; *Market Drayton, Salop*.

Duplicates.—*Sobrina*, *Dahlia*, *Glareosa*, *Chi*, *Rectilinea*, *Cursoria*, *Tritici*, *Valligera*.—*Charles Catto*; 10, *Cottown, Bridge of Don, by Aberdeen*.

Duplicates.—*Hyale* (2), *Betulæ* (2, male and female), *Ligustri*, *Hera*, *Putana*, *Viminalis*, *Oxyacanthæ*, *Pennaria*, *Ochrearia* (*Citraria*) and *Dilutata*. Black pins *Desiderata*.—*Cinxia*, *Athalia*, *C-Album*, *Epiphron*, *Typhon*, *Pruni*, *Minima* (*Alsus*), *Miana*, *Palæmon*, *Paniscus*, &c. (especially foresters), *Sesiidæ*, *Lithoridæ*, *Promissa* and *Moneta*.—*Reginald V. Solly*; 40, *West Southernhay, Exeter*.

Duplicates.—*Hyale*, *Quercus** (3), *Polychloros*,* *Corydon*, *Lucina*, *Luctuosa*,* &c. *Desiderata*.—*T. Betulæ*, *Myopæforme*, *Conspersa*.—*W. A. Carter*; *Barrow-in-Warwick, Bexley Heath*.

Imperata, *Desiderata*.—Pupa and well-set imagos.—*L. A. Spencer*; 52, *Burghley Road, Highgate Road, N.W.*

Duplicates.—*Biundularia*, *Papilionaria*, *Ulmata*, *Venosata*, *Pygmæata*, *Bipunctaria*, *Heliothis marginata*, *Carpophaga*, *Polyodon* (dark vars.), *Miniata*, *Complanula*, *Mines of Lithocolletis insignitella*.—*John E. Robson*; 15, *Northgate, Hartlepool*.

Duplicates.—*Turfosalis*, *Hamellus*, *Lafawryana*, **Teucris*, *Ericetana*, *Pygmæana*, *Oppressana*, *Candidulana*, *Pinicolana*, *Biarcuana*, *Dubitana*, *Denarniana*, *parmanella*, *Unimaculella*, *Rubiella*, *Cytisella*, *Atmoriella*, *Pedella*, *Pinicolella*, *Cysselina*, *Orichalcella*, *Illigerellus*, *Hortella*, *B. Cratægi*. *Desiderata*.—Many local micros.—*E. A. Atmore*; *King's Lynn, Norfolk*.

Duplicates.—*Cinxia*, **Duplaris*, **Potatoria*, **Triplasia*, *Festuca*, **Cruda*, **apsincola*, **Camelina*, **Popularis* (both sexes), *Lunosa*, *Derivata*, *Fuscantaria*, **iliaria*, *Impluviata*, *Suffumata*, *Corylata*, **Strigillaria* (both sexes), *Badiata*, *retularia* (black). *Desiderata*.—*Firmata*, *Dolobraria*, *Pictaria*, *Spartiatia*, *Plumeolata*, *Virgaureata*, *Pimpinellata*, *Valerianata*, *Subnotata*, *Orbicularia*, *Unifasciata*. Good insects only.—*J. Arkle*; 2, *George, Street, Chester*.

Duplicates.—*T. Quercus*, **T. W-Album*, **Suspecta*, *Cerago*, **Gilvago*, **Ferruginea*, **Viminalis*, *Oleracea*, **Fibrosa*, *Vinula*, *Rubricosa*, *Haworthii*, *Quercifolia*, *udorina*, *Subtusa*, *T. Cratægi*, *Persicariæ*, *Ianthina*, *Fimbria*, *Unca*, *Complana*, *tramineola*, *Papilionaris*. *Desiderata*.—*Bicuspis*, *Bifida*, *Alni*, *Daphidice*, *Pruni*, *etula*, *Arion*. List if desired.—*W. E. Baker*; *Tilney All Saints, King's Lynn*.

ENTOMOLOGICAL SOCIETY OF LONDON (11, Chandos Street, Cavendish Square, W.).—Wednesday, October 2nd, at 8 p.m. Paper to be read: "*Lepidoptera heterocera* from Northern China, Japan and Corea," part v.: by the late John Henry Leech, B.A., F.L.S., &c.; communicated by R. South, F.E.S.

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Duplicates.—*Argolus*,* *Biuridularia** (*Welsh*), *Tiliaria*,* *Trilineararia*,* *Falcula*,* *Aversata*,* *Fimbria*,* *Rhamnata*,* *Smaragdaria*,* *Unifasciata*,* *Holosericata*,* *Elymi*,* *Unguicula*,* *Rusticata*,* *Camelina*,* *Io*,* *Sobrinata** (*Scotch and Southern*) *Brevilinea*, *Lutosa*, *Petrificata*, *A. Dilutaria*, *Aureola*, *Ægon*, *Linea*, *Minos* (*Welsh*) *Irrarella*. *Desiderata*.—Ova, larvæ, or pupæ. *Testudo*, *Rubricollis*, *Coryli*

punctata, Campanulata, Togata, Sesalata, Viretata, Simulata, P. Populi, Furcula, S. Urtica, Dicta, Dictæoides, Trepida, Dromedarius, Chaonia, Dodonea, S. Populi, Umbratica, H. Urtica, Plantaginis, Iota, Morpheus, Blandina, Taraxaci. Accepted offers only answered.—*Colonel Partridge; 72, St. John's Park, Blackheath.*

Duplicates.—Bellargus, Corydon, H. Comma, Elpenor, S. Populi, S. Ligustri, Griseola, Neustria, Versicolor, Fagi, Pigra, Anachoreta (St. Leonards, Perla, L. Comma, Bondii, Scabriuscula, Popularis, Morpheus, Ambigua, Puta, Stigmatica, Janthina, Fimbria, Lota, Macilenta, Vaccinii, Flavago, Aurago, Affinis, Capsincola, Chi. Lutulenta, Oxyacanthæ, Protea, Verbasci, Libatrix, Luctuosa, Fasciana, Nupta, Prunaria, Autumnaria (Alniaria) from Folkestone, Lichenaria, Marginepunctata (Promutata), Leucophæaria, Brumata, Linariata. *Desiderata.*—Helice, Pruni, Arion, Muscerda, Quadra, Castanea, Harpagula, Auricoma, Albovenosa, Albipuncta, Lunigera, Simulans, Agathina, Ashworthii, Hyerborea, Irregularis, Contigua, and many others.—*W. E. Butler; Hayling House, Oxford Road, Reading.*

Duplicates.—Sibylla, Monacha, B. Quercus (males), Popularis, Neglecta, Aprilina, Rhizolitha, Satellitia, Sponsa, Cytisaria; pupæ of Prasinana and Oleracea; ova of Monacha, Popularis, Aprilina, Sponsa, Angularia, and Cervinaria. *Desiderata.*—Athalia, Epiphron, Æthiops, H. Comma, Artaxerxes; ova of Proteus, and pupæ of many species.—*A. M. Smallpeice; Field Lodge, Burley, Ringwood, Hants.*

Duplicates.—Aurago, Lutulenta (not all perfect), Protea, Oxyacanthæ var. Capucina; all on black pins. *Desiderata.*—Any of Sesiidæ; Ligniperda, B. Rubi, P. Populi, Alniaria, Bifida, Tridens, and very many more.—*H. Woodhead; Lyndon Villa, Somers Road, Barbourne, Worcester.*

Duplicates.—Lucina, Convolvulus (pairs), Ligustri, Cæruleocephala, Populeti, Flavocincta, Macilenta, Spadicea, Oxyacanthæ, Macularia, Wavaria, Associata, Atrata, &c. *Desiderata.*—A. Cratægi, Iris, Cinxia, Æthiops, Cassiope, Davus, Pruni, Arion, Paniscus, Sesiidæ, Minos, Revayana, Centonalis, Albulalis, Ilcifolia, Aniola, Fagi, Dodonæa, Versicolor. Any local species, South-East, East, or North.—*James Douglas; Dunollie, Sherborne, Dorset.*

Duplicates.—T. Quercus,* T. W. Album,* Cinxia,* Rhamni, Alniaria* (fine), Angularia,* Oleracea,* Janthina,* Fimbria,* Cerago,* Gothica, Rubricosa, Persicaria, suspecta, Pinastris, Plecta, Gilvago* (fine), Ferruginea,* Cæruleocephala, Pudorina, Tegacephala, Derasa (few), Minos, Miniata, Irrorella, Potatoria, Lucipara, Stabilis, and others. *Desiderata.*—Numerous.—*W. E. Baker; Tilney All Saints, King's Lynn.*

Duplicates.—Edusa, Aglaia, Adonis, Corydon, Tiliæ, Trifolii, Irrorella, Domitula, Chrysorrhæa, Flavicornis, Myrtilli, Tritici, Puta, Serena, Parthenias, Adenaria, Hispidaria, Hirtaria, Piniaria, Taminata, Citraria. *Desiderata.*—Numerous.—*C. Levett; 107, Brockley Road, London, S.E.*

Duplicates.—Paphia, Aglaia, Atalanta,* Semele, Galatea, Cardamines, Adonis, Corydon, Agestis, Minima, Argiolus, H. Comma, Malvæ, S. Ligustri, Stellatarum,* dispar,* Chrysorrhæa, Anachoreta (2), Prasinana,* L. Comma, C-Nigrum, Pallens, unosa, Pistacina, Macilenta, Vaccinii, Umbratica, Salicis, Suffusa, Conigera, niceps, Matura, Dominula, Taminata, Plagiata, Ornata, Æscularia, Clathrata, silvaria, Alniaria (Autumnaria*), and single specimens of other kinds. *Desiderata.*—Indulanus, Strigula, Albulalis, Arundinis, Testudo, Asellus, Fascelina, P. Populi, luctuosa, Ridens, Orion, Leporina, Turca, Hispidus, Præcox, Abjecta, Opima, comissa, and many others.—*H. Douglas Stockwell; 2, Albert Road, Dover.*

Duplicates.—Exulans, Puta, Suffusa, Corticea, Nigricans, Glareosa, Triangulum, festiva, Sobrina, Neglecta, Xanthographa (dark), Tragopogonis, Suspecta, Macilenta, Litura, Vaccinii, Circellaris, Chi, Aprilina, Exoleta, Solidaginis, Autumnaria,* obscuraria (pale), Fumata, Humiliata (few), Æscularia (males), Salicata, Tenuiata,* utata, Bicolorata, &c.; all well set and on black pins. *Desiderata.*—Albimacula, teago, Irregularis, Chrszona, Lichenea, Succenturiata, Plumbeolata, Pygmæata, elveticata, Egenaria, Jasioneata, Trisignata, Virgaureata, Fraxinata, Valerianata, riguata, Campanulata, Indigata, Constrictata, Abbreviata, Dodoneata, Coronata, retata, &c.; must be well set.—*J. P. Mutch; 405, Hornsey Road, London, N.*

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Duplicates.—Machaon,* Sinapis, Edusa, Valesina, C-Album,* Hyperanthus, testis, Ægon, S. Ligustri,* Geryon, Ambigua, Papilionaria, Vernaria, Viridata, teata, Euphorbiata, Ulmata, Sponsa, Promissa, L. Cribrum, Belgaria, and oes of many. *Desiderata.*—Bembeciformis, Scoliaformis, Centonalis, Corticea, rina, Arundinis, Maritima, Palustris, Circellata, Fluctuosa, Irriguata, Dodoneata, hiogramma, Crambidæ, and Pterophoridæ. Accepted offers answered by return.

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*Many of the following references to Odonata occur under little-known synonyms,
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ERRATA, &c.

- Page 99, fourth line from bottom, for "50" species read "57."
 ,, 100, delete first line.
 ,, 133, third line from bottom, for "sytypal" read "typical."
 ,, 206, third line from bottom, for "an hermaphrodite" read "gynandro-morphous."
 ,, 232, footnote, lines 2 and 4, for "Montaudon" read "Montandon."
 ,, 238, line 15 of third paragraph, for "avirous" read "avirons."
 ,, 238, first footnote, line 3, for "devous" read "devons."
 ,, 238, second footnote, line 1, for "pratiquerous" read "pratiquerons."
 ,, 239, line 4 of third paragraph, for "avous" read "avons."
 ,, 239, footnote. N.B.—This refers to the "Iconographie," not to the "Hémiptères."
 ,, 264, footnotes 12, 13, and 14 have been transposed; 12 should be 13, 13 should be 14, and 14 should be 12.

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